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62D CONGRESS, 1st Session | SENATE | DOCUMENT No. 110

REPORT ON

CONDITIONS OF EMPLOYMENT IN THE IRON AND STEEL INDUSTRY

IN THE

UNITED STATES

IN 4 VOLUMES

VOLUME I: WAGES AND HOURS OF LABOR

Prepared under the direction of
CHAS. P. NEILL
Commissioner of Labor

WASHINGTON
1911

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IN THE SENATE OF THE UNITED STATES,
August 21, 1911.

Resolved, That the report of the Secretary of Commerce and Labor concerning the conditions of employment prevailing in the iron and steel industry of the United States, submitted in compliance with Senate resolution numbered Two hundred and thirty-seven, Sixty-first Congress, second session, be printed, with accompanying illustrations, as a public document.

Attest:

CHARLES G. BENNETT,
Secretary.

By HENRY H. GILFRY,
Chief Clerk.

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CONTENTS.

Page.

Letters of transmittal ..... vii, viii
Introduction and summary ..... ix–lxiii
Introduction ..... xi–xiv
General summary ..... xiv–xvii
Summary of earnings and hours and days of work in blast furnaces, steel works, and rolling mills, by departments and districts ..... xviii–lxiii
Extent of the investigation ..... xviii–xxiv
Earnings, by departments ..... xxiv–xxxiv
Earnings, by departments and districts ..... xxxiv–xxxix
Earnings of common laborers ..... xxxix–xlii
Hours of labor, by departments ..... xlii–lii
Hours of labor, by departments and districts ..... lii–lix
Days worked per week, by departments ..... lix–lxiii
Chapter I.—Earnings, hours of labor, and days worked in productive occupations, by departments 1–334
Nature of data and method of presentation 3–9
Blast furnaces 9–49
Introduction 9
Summary of earnings and hours and days of work 9–14
Earnings 9–11
Hours of labor 11, 12
Days per week 12–14
General description of equipment and method of operation 14–19
Description of occupations 19–30
Earnings and hours and days of work, by occupations 30–49
Bessemer converters 49–79
Introduction 49
Summary of earnings and hours and days of work 49–52
Earnings 49–51
Hours of labor 51
Days per week 52
General description of equipment and method of operation 52–55
Description of occupations 55–66
Earnings and hours and days of work, by occupations 66–79
Open-hearth furnaces 79–107
Introduction 79
Summary of earnings and hours and days of work 79–82
Earnings 79–81
Hours of labor 81
Days per week 82
General description of equipment and method of operation 82–86
Description of occupations 86–94
Earnings and hours and days of work, by occupations 94–107

Digitized by Google

Chapter I.—Earnings, hours of labor, and days worked in productive occupations, by departments—Continued. Page

Puddling mills ... 107-129
Introduction ... 107
Summary of earnings and hours and days of work ... 107-110
Earnings ... 107-109
Hours of labor ... 109, 110
Days per week ... 110
General description of equipment and method of operation ... 110-113
Description of occupations ... 113-117
Earnings and hours and days of work, by occupations ... 117-129
Crucible furnaces ... 129-143
Introduction ... 129
Summary of earnings and hours and days of work ... 129-131
Earnings ... 129, 130
Hours of labor ... 130
Days per week ... 131
General description of equipment and method of operation of rolling mills ... 131, 132
Description of occupations ... 132-134
Earnings and hours and days of work, by occupations ... 135-143
Blooming mills ... 143-177
Introduction ... 143
Summary of earnings and hours and days of work ... 143-145
Earnings ... 143, 144
Hours of labor ... 145
Days per week ... 145
General description of equipment and method of operation of rolling mills ... 146-153
Description of occupations ... 153-163
Earnings and hours and days of work, by occupations ... 163-177
Plate mills ... 178-202
Introduction ... 178
Summary of earnings and hours and days of work ... 178-180
Earnings ... 178, 179
Hours of labor ... 179, 180
Days per week ... 180
Description of occupations ... 181-189
Earnings and hours and days of work, by occupations ... 189-202
Standard rail mills ... 203-223
Introduction ... 203
Summary of earnings and hours and days of work ... 203-205
Earnings ... 203, 204
Hours of labor ... 204, 205
Days per week ... 205
Description of occupations ... 205-211
Earnings and hours and days of work, by occupations ... 211-223
Structural, light rail, and other shape mills ... 224-242
Introduction ... 224
Summary of earnings and hours and days of work ... 224-226
Earnings ... 224, 225
Hours of labor ... 225, 226
Days per week ... 226

Digitized by Google

Chapter I.—Earnings, hours of labor, and days worked in productive occupations, by departments—Concluded. Page.
Structural, light rail, and other shape mills—Concluded.
Description of occupations ... 226–229
Earnings and hours and days of work, by occupations ... 229–242
Miscellaneous mechanical mills ... 243–257
Introduction ... 243
Summary of earnings and hours and days of work ... 243–245
Earnings ... 243, 244
Hours of labor ... 244, 245
Days per week ... 245
Earnings and hours and days of work, by occupations ... 245–257
Bar mills ... 257–292
Introduction ... 257
Summary of earnings and hours and days of work ... 257–260
Earnings ... 257–259
Hours of labor ... 259, 260
Days per week ... 260
Description of occupations ... 260–267
Earnings and hours and days of work, by occupations ... 267–292
Garrett rod mills ... 292–311
Introduction ... 292
Summary of earnings and hours and days of work ... 293–295
Earnings ... 293, 294
Hours of labor ... 294, 295
Days per week ... 295
Description of occupations ... 295–298
Earnings and hours and days of work, by occupations ... 298–311
Tube mills ... 311–334
Introduction ... 311
Summary of earnings and hours and days of work ... 311–313
Earnings ... 311, 312
Hours of labor ... 313
Days per week ... 313
General description of equipment and method of operation ... 314–317
Description of occupations ... 317–322
Earnings and hours and days of work, by occupations ... 322–334
Chapter II.—Earnings, hours of labor, and days worked in nonproductive occupations, by departments ... 335–499
Introduction ... 337
Summary of earnings and hours and days of work, by districts ... 337–342
Earnings and hours and days of work, by occupations ... 343–426
Earnings ... 344–376
Customary working hours per week ... 376–401
Days worked per week ... 401–426

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Chapter II.—Earnings, hours of labor, and days worked in nonproductive occupations, by departments—Concluded. Page.

Earnings and hours and days of work of employees in nonproductive occupations—General occupations, producing departments 426–470
Summary of earnings and hours and days of work 427–432
Earnings and hours and days of work, by departments 432–470
Blast furnaces 432–435
Bessemer converters 436–438
Open-hearth furnaces 439–442
Puddling mills 442–445
Crucible furnaces 445–447
Blooming mills 447–450
Plate mills 450–453
Standard rail mills 453–456
Structural, light rail, and other shape mills 456–458
Miscellaneous mechanical mills 459–461
Bar mills 461–465
Garrett rod mills 465–468
Tube mills 468–470
Earnings and hours and days of work of employees in nonproductive occupations—Power, mechanical, and yard force 471–499
Summary of earnings and hours and days of work 472–475
Earnings and hours and days of work, by departments 475–499
Steam, gas, and water 475–479
Yard and transportation 479–483
Electric power and repairs 483–487
Shops 487–491
Mechanical repairs 491–494
Shipping 494–496
Miscellaneous 497–499

Chapter III.—Earnings, hours of labor, and days worked in steel foundries, by occupations 501–522
Introduction 503, 504
Summary of earnings and hours and days of work 504–508
Earnings 504–506
Hours of labor 506, 507
Days per week 508
Earnings and hours and days of work 509–522
By occupations 509–513
By districts 514–522

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LETTERS OF TRANSMITTAL.

DEPARTMENT OF COMMERCE AND LABOR,
OFFICE OF THE SECRETARY,
Washington, July 31, 1911.

SIR: In partial compliance with Senate resolution 237, of June 23, 1910, I have the honor to transmit herewith a report dealing with wages and hours of labor in the principal occupations in the iron and steel industry in the United States.

The resolution in response to which these data are transmitted reads as follows: "*Resolved*, That the Department of Commerce and Labor, through the Bureau of Labor, be, and is hereby, directed to investigate and report to the Senate as early as possible as to the conditions of employment prevailing in the iron and steel industry of the United States, with the details concerning the wages paid, the hours of labor per day and the number of days' labor per week, and the number employed."

The investigation directed by the resolution is still under way, and further reports dealing comprehensively with the conditions of employment will be transmitted as rapidly as they can be completed.

Respectfully,

CHARLES NAGEL,
Secretary.

Hon. JAMES S. SHERMAN,
President of the Senate, Washington, D. C.

DEPARTMENT OF COMMERCE AND LABOR,
BUREAU OF LABOR,
Washington, July 29, 1911.

SIR: In partial compliance with Senate resolution 237, of June 23, 1910, I beg to transmit herewith a report dealing with wages and hours of labor in the principal occupations in the iron and steel industry in the United States.

The preparatory work of this investigation was begun in July, 1910, the field work was begun last September, and the work of investigation and the preparation of the report has been carried on steadily ever since. The field work is now being brought to a conclusion rapidly, and the reports embodying the further results of

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the investigation will be transmitted in order as soon as they can be completed.

The general investigation has been carried on under the direction of G. W. W. Hanger, chief statistician of the Bureau; the preparation of the volume herewith transmitted was carried on under the immediate direction of Charles E. Baldwin, statistical expert, and Basil M. Manly, special agent.

I am, very respectfully,

CHAS. P. NEILL,
Commissioner.

To HON. CHARLES NAGEL,
Secretary of Commerce and Labor.

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INTRODUCTION AND SUMMARY.

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INTRODUCTION.

This report shows earnings and hours of labor of employees in practically all of the iron and steel plants in the United States. The report is the result of an investigation directed by a Senate resolution, under the provisions of which the Department of Commerce and Labor, through the Bureau of Labor, was directed to make an investigation of the conditions of employment, including especially wages paid and hours and days worked in the iron and steel industry of the United States.

The data presented cover the conditions existing in the month of May, 1910, immediately after the last general increase in wages. Since that time there have been no general changes in wages, and very few minor readjustments, so that the data as to earnings given here represent almost exactly the conditions existing at the present time (July, 1911).[1] As regards 7-day work in the industry, conditions have been somewhat altered by the fact that a number of plants in various parts of the country have, during the last few months, in response to the movement inaugurated by the American Iron and Steel Institute since the beginning of the present investigation, put into effect various plans by which the employees are relieved from the requirement of working 7 days per week. The extent to which such plans have been introduced and the measure of relief afforded by their operation are discussed at length in Volume III of this report.

The term "iron and steel industry" for the purposes of this investigation was taken in the sense in which the term is generally used, to include the blast furnaces, steel works, and rolling mills (puddling mills and tube mills being embraced under this head), together with such repair, yard-transportation, power, and other auxiliary departments as are included within the plant. The investigation did not attempt to cover the mines and coke ovens, or the fabricating and assembling departments, even where these departments were operated directly in connection with the steel works. Although no specific attempt was made to include foundries or forges, except as they were auxiliary departments of steel works, data as to wages and hours of labor for a majority of the steel foundries of the United

[1] This statement was still true in December, 1911, when this volume went to press.

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States were secured and are presented in a separate chapter of this volume.

As it was practically impossible for the agents of the Bureau of Labor to visit every plant in the United States and personally to copy the desired data from the pay rolls, blank forms were prepared by the Bureau calling for certain specific data concerning the number of employees, rates of wages, hours of labor, and days worked, in detail, together with a specific statement of the number of hours worked and amount of wages earned during the last pay-roll period in May, 1910, by the workmen in all the various occupations. These forms, together with detailed instructions, were sent to every company engaged in the manufacture of iron and steel in the United States. With but few exceptions the manufacturers complied with the request, and themselves copied from their pay rolls and compiled the detailed information called for on the printed forms, and transmitted them to the Bureau.

During the preparation of the report the Bureau was in correspondence with the officials of the various companies, and the agents of the Bureau also visited the different plants whenever necessary to bring about a clear understanding of the precise character of the information desired, as well as to secure the correction of such errors as were found in the data submitted by the plants.

For the purpose of a proper presentation and interpretation of the information thus obtained, the agents of the Bureau visited a large number of representative plants in each of the principal centers of industry and made a careful study of the various processes and occupations in each of the several departments. The information thus obtained has been presented in the detailed descriptions of occupations which accompany the statistical matter relating to each of the departments of the industry.

By this method reports were secured from practically all of the plants in the United States coming within the scope of the investigation and covering approximately 90 per cent of the total number of employees in the industry. A few plants were not in operation at the time of the investigation, and were therefore unable to furnish the desired information. In a number of cases it was found impossible to utilize the information forwarded by certain plants or for particular departments of such plants. This arose chiefly from the following causes: (1) In a number of the smaller plants no adequate record of the wages paid, or, more particularly, of the hours worked during the period called for could be furnished; (2) in a number of departments some plants had the greater part of the work done by contract, paying a contractor who employed his own men, and who as a rule could not or would not furnish records of amounts paid or the hours worked by his employees. This latter condition affected

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particularly the reports for puddling mills, crucible furnaces, and small rolling mills. All reports which for these or other causes could not be corrected were rigidly excluded from the tabulation. A few reports were also excluded because they were forwarded too late to be included in the tabulation, although otherwise the information was in good condition. These, however, were in all cases unimportant plants whose inclusion or exclusion would have a negligible effect upon the figures of this report. The plants of the Bethlehem Steel Co. are not included in this investigation, having been the subject of a special investigation and report immediately before the beginning of this investigation.[1] Sheet mills for the manufacture of sheet steel and tin and terne plate are not covered in the present volume, owing to the fact that these establishments were the subject of a special investigation along somewhat different lines, the results of which will form a part of Volume III of this report.

As a result of the exclusion of imperfect reports for the reasons above given, the data presented in the present volume cover approximately 82 per cent of the employees in the branches of the industry investigated. In this volume complete data as to wages and hours of labor are presented for 199,689 employees, of whom 172,706 were employed in the blast furnaces, steel works, and rolling mills, and 26,983 in the steel foundries. In all, 416 separate and distinct plants in 29 States are included, of which 338 were blast furnaces, steel works, and rolling mills, and 78 were steel foundries alone.

In the present volume are presented the statistics of earnings and hours and days of work for the separate departments and industrial districts in summary form, together with such discussion and descriptive matter as are necessary to make the data clear and intelligible to those who are not acquainted with the technical processes and the general labor conditions of the industry. In Volume II are presented in detail the earnings and hours and days of work in the various occupations in each of the establishments covered by the investigation.

In addition to the information furnished from the pay rolls of the establishments, a thorough study was also made in detail of the conditions of employment in the iron and steel industry generally by personal inspection of the plants themselves, and through personal interviews with the employees and officials of the different establishments. A special study was also made of the statistics of accidents in the industry, of the conditions under which accidents occur in the various plants, of the methods used to prevent accidents, and of the provisions made for the care of employees injured by accidents. The

[1] Report on Strike at Bethlehem Steel Works, South Bethlehem, Pa., 61st Cong., 2d sess., S. Doc. No. 521. The wages given in the Bethlehem report were for January, 1910, and are not fairly comparable with those given in the present volume for other steel plants. A general increase in wages took place in the iron and steel industry in April and May, 1910, and the figures in this report are based upon the wages paid after the increase, while the figures in the Bethlehem report represent a date before the increase.

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results of these studies of conditions of employment and of accidents and accident prevention will form the subjects of later volumes of this report.

GENERAL SUMMARY.

The fact that stands out most strikingly in any study of the labor conditions in the iron and steel industry in the United States is the unusually long schedule of working hours to which the larger number of the employees in this industry are subject.

During May, 1910, the period covered by this investigation, 50,000, or 29 per cent, of the 173,000 employees of blast furnaces and steel works and rolling mills covered by this report customarily worked 7 days per week, and 20 per cent of them worked 84 hours or more per week, which, in effect, means a 12-hour working day every day in the week, including Sunday. The evil of 7-day work was particularly accentuated by the fact developed in the investigation, that the 7-day working week was not confined to the blast-furnace department where there is a metallurgical necessity for continuous operation, and in which department 88 per cent of the employees worked 7 days a week; but it was also found that, to a considerable extent, in other departments where no such metallurgical necessity can be claimed, productive work was carried on on Sunday just as on other days of the week. For example, in some establishments the Bessemer converters, the open-hearth furnaces, and blooming, rail, and structural mills were found operating 7 days a week for commercial reasons only.

The hardship of a 12-hour day and a 7-day week is still further increased by the fact that every week or two weeks, as the case may be, when the employees on the day shift are transferred to the night shift, and vice versa, employees remain on duty without relief either 18 or 24 consecutive hours, according to the practice adopted for the change of shift. The most common plan to effect this change of shift is to work one shift of employees on the day of change through the entire 24 hours, the succeeding shift working the regular 12 hours when it comes on duty. In some instances the change is effected by having one shift remain on duty 18 hours and the succeeding shift work 18 hours. During the time that one shift is on duty, of course, the employees on the other shift have the same number of hours of relief from duty.

That much of the Sunday labor which has been prevalent in the steel industry is no more necessary than in other industries is shown conclusively by the fact that at the time of the investigation made in 1910 by this Bureau into the conditions of labor in the Bethlehem Steel Works, the president of the Steel Corporation directed the rigid enforcement of a resolution adopted three years previous, cutting out a large

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part of Sunday work except in the blast-furnace department. Even in the blast-furnace department, where there is a metallurgical necessity for continuous operation day and night throughout 7 days of the week, there is practically nothing except the desire to economize in the expense of production that has prevented the introduction of a system that would give each employee 1 day of rest out of the 7.

Since the beginning of the present investigation, however, this matter of abolishing 7-day work for the individual employees in the blast furnaces, as well as in other departments of the industry, has received the attention of the American Iron and Steel Institute, and through a committee of that organization a plan has been proposed which gives each employee one day of rest each week. A number of the plants throughout the country have, at the instance of the Institute, adopted this plan or some modification of it, and have successfully operated it for several months. A thorough discussion of these plans and of their value in solving the problem to which they are applied will be found in the volume dealing with the general conditions of labor in the industry.

During the investigation those in charge of the plants have in their discussions with representatives of the Bureau frequently emphasized the fact that the men working these very long hours are not kept busy all the time. To a considerable extent this is perfectly true; but the employees in question are on duty and subject to orders during the entire period, and they are not, except in rare instances, allowed to leave the plant. It should not be overlooked that it is not simply the character or the continuity of the work, but the fact that in the case of the 12-hour-a-day man one-half of each 24 hours—more than three-fourths of his waking hours—is spent on duty in the mills, which is of significance to the worker and his family. Nothing has been done by the manufacturers nor have any proposals been made to lessen the proportion of men working 72 hours or more per week. It was found in this investigation that nearly 43 per cent of the 173,000 employees in the iron and steel industry were working at least 72 hours per week, or 12 hours per day for 6 days a week. This proportion remains unchanged, being unaffected by the plan to give the men who were working 84 hours per week one day of rest in seven.

An added significance attaches to the conditions of labor here described as characteristic of the iron and steel industry when we consider that the general tendency in other industries for years past has been toward a shorter working-day. Years ago the 10-hour day became almost a standard; since that time further reductions have brought the working-day to 9, and in many cases, to 8 hours, and this reduction has been accompanied by a part holiday on Saturday. It is, therefore, in striking contrast to this general tendency in other

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industries to find in a great basic industry, such as that part of the iron and steel industry covered in this report, that approximately only 14 per cent of the 173,000 employees work less than 60 hours per week and almost 43 per cent work 72 hours or over per week.

Another striking characteristic of the labor conditions in the iron and steel industry is the large proportion of unskilled workmen in the labor force. These unskilled workmen are very largely recruited from the ranks of recent immigrants. For the industry as a whole, not far from one-half of the 91,463 employees in the productive iron and steel occupations included within this investigation were of the class of unskilled workmen. In the blast-furnace department, the largest single department in the industry, more than two-thirds of the 24,722 employees in productive occupations were unskilled laborers, a large proportion of whom do not yet speak or understand English; and even in the South the number of immigrants employed in the industry is rapidly increasing.

Taking the employees in all occupations in the industry, nearly 60 per cent are foreign-born, and nearly two-thirds of the foreign-born are of the Slavic races. Large as is the proportion that unskilled labor forms of the total labor force in the iron and steel industry, steel experts have noted the fact that the tendency of recent years has been steadily toward the reduction of the number of highly skilled men employed and the establishment of the general wage on the basis of common or unskilled labor. Nor is this tendency likely to diminish, since each year sees a wider use of mechanical appliances which unskilled labor can easily be trained to handle.

Of the total of 172,706 employees, 13,868, or 8.03 per cent, earned less than 14 cents per hour,[1] 20,527, or 11.89 per cent, earned 14 and under 16 cents, and 51,417, or 29.77 per cent, earned 16 and under 18 cents. Thus 85,812, or 49.69 per cent of all the employees, received less than 18 cents per hour. Those earning 18 and under 25 cents per hour numbered 46,132, or 26.71 per cent, while 40,762, or 23.61 per cent, earned 25 cents and over. A few very highly skilled employees received $1.25 per hour; and those receiving 50 cents and over per hour numbered 4,403, or 2.55 per cent of all employees.

In general it may be said that earnings of less than 18 cents per hour represent unskilled labor. The group earning 18 and under 25 cents per hour represents semiskilled workmen, while those earning 25 cents and over per hour are skilled employees. The most common rate per hour for unskilled labor in the New England district was 15 cents; in the Eastern district, 13 and 14 cents; in the Pittsburgh district, 16 and 17 cents; in the Great Lakes and Middle West district,

[1] Throughout this report the earnings given represent the actual amount earned by the employee less the amount paid helpers and other employees for their assistance, where work is done on a contract basis. No account is taken of deductions for hospital or medical fees and similar deductions for which the employee receives some return.

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15, 16, and 17 cents; and in the Southern district, 10, 12½, 13, and 13½ cents.[1]

A brief summary of the conditions as regards earnings, hours, and days worked per week in the industry is given in the table which follows. It is given here as preliminary to a more detailed examination of the results of the investigation, department by department.

SUMMARY OF EARNINGS AND HOURS OF LABOR, BY BRANCHES OF THE INDUSTRY.

Branches of industry.	Number of plants.	Number of employees.	Earnings per hour. Per cent of employees earning— Under 16 cents.	Under 18 cents.	25 cents and over.	Hours per week. Per cent of employees customarily working— 84 hours and over.	72 hours and over.	60 hours and under.	Per cent of employees customarily working 7 days per week.
Blast furnaces	156	21,354	31.70	65.96	7.70	[1] 62.79	[1] 68.55	[1] 10.71	[1] 87.88
Steel works and rolling mills:									
Bessemer converters	24	5,618	13.88	47.03	26.36	.18.08	65.61	17.84	24.07
Open-hearth furnaces	80	14,618	20.04	48.80	23.75	23.65	76.29	8.07	30.20
Puddling mills and crucible furnaces	58	7,499	17.53	27.89	51.46	.65	3.85	72.47	1.42
Rolling mills	212	43,631	15.88	40.25	32.45	[2] 8.28	[2] 40.68	31.23	[2] 10.00
Tube mills	12	4,252	8.77	47.81	11.71	1.55	3.71	65.85	1.93
Total, steel works and rolling mills.	212	75,608	16.30	41.61	31.03	[2] 10.85	[2] 43.69	[2] 31.79	[2] 13.65
Power, mechanical, and yard force	168	65,744	18.45	51.22	22.64	11.70	28.94	55.56	19.34
Grand total	[3] 338	172,706	19.92	49.69	23.60	[4] 20.59	[4] 42.58	[4] 37.02	[4] 29.28

[1] Not including 31 employees who worked 2 days only, and 2 employees who worked 3 days only.
[2] Not including 2 employees who worked 1 day only.
[3] Actual number of plants. The total number of plants can not be obtained by simple addition of the number of plants having the specified departments, as many plants have two or more departments. For example, many plants with blast furnaces have also steel works and rolling mills. See table, p. xviii.
[4] Not including 2 employees who worked 1 day only, 31 employees who worked 2 days only, and 2 employees who worked 3 days only.

The facts presented in the above table are of such simple character that no explanation is necessary. It is sufficient merely to point out the wide differences which exist between the various departments. The blast furnaces show the lowest general level of earnings, 65.96 per cent of all the employees in that branch of the industry earning less than 18 cents per hour, 31.7 per cent earning less than 16 cents per hour, and only 7.7 per cent, or 1 man in 13, earning as much as 25 cents per hour. More than four times as many employees earned less than 16 cents per hour as earned 25 cents or more per hour. The highest general level of earnings shown are for the puddling mills and crucible furnaces, where 51.46 per cent of the employees earn 25 cents and over per hour and 27.89 per cent earn under 18 cents per hour. Even greater differences exist between the different branches of the industry as regards working time. The blast furnaces and open-hearth furnaces show the longest schedule of working hours, and the tube mills, puddling mills, and crucible furnaces decidedly the shortest.

[1] For explanation of these districts as used in this report, see p. xix

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SUMMARY OF EARNINGS AND HOURS AND DAYS OF WORK IN BLAST FURNACES, STEEL WORKS, AND ROLLING MILLS, BY DEPARTMENTS AND DISTRICTS.

EXTENT OF THE INVESTIGATION.

The data presented in the following section are for blast furnaces, steel works, and rolling mills, together with their auxiliary departments. The data for steel foundries, which fall outside the scope of the investigation as originally planned, are not included here, but are presented in a separate chapter of this volume.

The report for blast furnaces, steel works, and rolling mills covers 338 plants located in 25 States and the District of Columbia. The distribution of the plants by States is shown in the following table, as well as the general character of the plants themselves:

NUMBER OF BLAST FURNACES, STEEL WORKS, AND ROLLING MILLS FOR WHICH DATA ARE REPORTED, BY STATES.

States.	Number of plants having specified departments.					Total
	Blast furnaces alone.	Blast furnaces with steel works and rolling mills.	Steel works and rolling mills.	Puddling mills and rolling mills.	Rolling mills alone.	
Maine				1		1
Massachusetts	2		1		1	4
Rhode Island			1		1	2
Connecticut			1			1
New York (New England district)	3		4	2	3	12
New York (Great Lakes and Middle West district)	[1] 3	2			1	6
New Jersey	4		4	1	3	12
Pennsylvania (Eastern district)	[2] 21	2	10	[3] 26	14	73
Pennsylvania (Pittsburgh district)	[4] 22	[1] 11	[4] 20	6	19	78
Delaware				1		1
Maryland		1			1	2
District of Columbia			1			1
Virginia	7					7
West Virginia (Wheeling district)		1	1		1	3
West Virginia (Southern district)					1	1
Kentucky	[4] 3		2	1		6
Tennessee	10			1		11
Georgia	2		1			3
Alabama	10	2			2	14
Ohio (Youngstown district)	9	[4] 5	2	2	6	24
Ohio (Lake and interior counties)	6	2	3	2	9	22
Ohio (Southern district)	9					9
Indiana		2		[5] 2	3	7
Illinois	3	3	4	1	8	19
Michigan	7				1	8
Wisconsin	2	1				3
Minnesota	1					1
Missouri	2				1	3
Colorado		1				1
Oregon				1		1
California				1	1	2
Total	[6] 126	[6] 33	[6] 55	[6] 48	76	338

[1] Including 1 plant which was combined with another plant of the same company in the wage reports.
[2] Including 1 plant which includes a puddling mill as well as the departments specified and 1 plant which was combined with another plant of the same company in the wage reports.
[3] Including 4 plants which were combined with other plants of the same company in the wage reports and 1 plant in which the puddling department was canceled because of imperfect data.
[4] Including 1 plant which includes a puddling mill as well as the departments specified.
[5] Including 1 plant in which the puddling department was canceled because of imperfect data.
[6] See notes to details.

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The plants represented in this table include every important plant in the United States,[1] and in every State and district cover practically all the plants which were in operation in May, 1910. The complete character of the information is seen when it is understood that the 159 blast-furnace plants for which data are reported contained 285 of the 289 stacks reported by the Iron Age as in blast in May, 1910. Every standard Bessemer plant in operation in May is covered in this report, there being one plant which operated its Bessemer department for only a short time during 1910, for which no data are reported. Similarly 80 of the 83 open-hearth-furnace plants in steel works are reported upon, and more than three-fourths of the puddling and rolling mills, although data are not available from which the exact proportions can be determined.

It will be noted in the above table that the distribution of the plants of different types in the different States is far from uniform. The large plants having blast furnaces, steel works, and rolling mills operated as one unit are chiefly located in the Pittsburgh district of Pennsylvania and the Youngstown district of Ohio. The puddling mills are to a large extent located in the eastern district of Pennsylvania, while the plants of the Southern States are nearly all blast furnaces not connected with steel works or rolling mills.

This difference in the character of the plants located in the different parts of the country is so marked that a division of the country into a small number of districts of significance in the industry is easily made. For the purpose of this report the iron and steel plants were grouped into six districts. The "New England" district includes the New England States and the eastern and central parts of New York State; the "Eastern" district includes New Jersey, eastern and central Pennsylvania, Delaware, and Maryland; the "Pittsburgh" district includes the western part of Pennsylvania and the northern part of West Virginia, as well as the eastern part of Ohio; the "Great Lakes and Middle West" district includes the Buffalo plants and the North Central States (with the exception of the southern and eastern section of Ohio), together with the scattered plants lying as far west as Colorado; the "Southern" district includes the southern section of Ohio and all of the Southern States except Maryland; the "Pacific Coast" district includes the few States along the coast.

The table following, which shows the character of the plants in the different districts, shows more clearly the nature of the geographical distribution of the industry.

[1] Except the Bethlehem Steel Works, which was the subject of a report just prior to this investigation.

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NUMBER OF BLAST FURNACES, STEEL WORKS, AND ROLLING MILLS FOR WHICH DATA ARE REPORTED, BY DISTRICTS.

Districts.	Blast furnaces only.	Blast furnaces with steel works and rolling mills.	Steel works and rolling mills.	Puddling mills with rolling mills.	Rolling mills only.	Total.
New England	5	.....	7	3	5	20
Eastern	25	2	14	28	17	89
Pittsburgh	31	17	23	8	26	105
Great Lakes and Middle West	24	11	7	5	23	70
Southern	41	3	4	2	4	51
Pacific Coast	.....	.....	.....	2	1	3
Total	126	33	55	48	76	[1] 338

[1] Actual number of plants. The total number of plants can not be found by simple addition of the number of plants having the specified departments, as many plants have two or more departments.

The blast-furnace plants, it will be noted, are very evenly distributed in the four principal districts. The importance of the Southern district as a producer of pig iron is apparently exaggerated by the above showing. As a matter of fact, while it has 44 plants with blast furnaces, in comparison with the 48 of the Pittsburgh district, the plants of the Pittsburgh district have twice the number of stacks and produce nearly three times as much pig iron as the plants in the Southern district. The separate rolling mills also, it will be noted, are fairly evenly distributed in the different districts.

The relative importance of the different districts is more clearly shown in the following table:

NUMBER OF PLANTS REPORTED AND NUMBER AND PER CENT OF EMPLOYEES IN PRODUCTIVE AND IN GENERAL OCCUPATIONS FOR WHOM DATA ARE REPORTED, BY DISTRICTS.

Districts.	Number of plants.	Number of employees in—			Per cent of employees in each district in—		Per cent of employees in each district.
		Productive occupations.	General occupations.	All occupations.	Productive occupations.	General occupations.	
New England	20	2,506	1,587	4,093	61.2	38.8	2.4
Eastern	89	17,835	10,256	28,091	63.5	36.5	16.3
Pittsburgh	105	42,326	40,050	82,376	51.4	48.6	47.7
Great Lakes and Middle West	70	21,997	24,052	46,049	47.8	52.2	26.7
Southern	51	6,586	5,198	11,784	55.9	44.1	6.8
Pacific Coast	3	213	100	313	68.1	31.9	.2
Total	338	91,463	81,243	172,706	53.0	47.0	100.0

From the above table it will be seen that while the Pittsburgh district has less than one-third of all the plants reported it embraces approximately 48 per cent of all the employees in the industry. Similarly, the plants of the Great Lakes and Middle West district, while 19 fewer in number than those of the Eastern district, because

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of the larger size of the plants, have more than 50 per cent more employees. While the Pacific Coast district is insignificant as regards number of employees, the wages in that district are so far different from those in the remainder of the country that it was necessary to present the facts separately.

In the presentation of the facts as regards wages and hours of labor in the industry, the primary classification of the employees is that shown in the table. This division of the employees between those directly connected with the production of iron and steel and those whose work is of a general character connected with the production of power, transportation, and in general with the maintenance of the plant is fundamental to a proper understanding of the labor situation in the industry. The working conditions of the two groups are widely different as regards physical surroundings, general nature of the work, and hours of labor. Furthermore, the employees in the general occupations are largely machinists or in the skilled and semiskilled mechanical trades, and the iron and steel industry is in direct competition with many other industries in employing them. In the productive occupations the work of all the skilled and semiskilled employees is specialized to a considerable degree, so that they are to a large extent dependent upon the iron and steel industry for employment.

It will be noted that for the industry as a whole these two groups of employees are of very nearly the same size, the productive occupation group embracing 53 per cent of all employees, and the general occupation group embracing 47 per cent. The very large proportion of the total labor force which these employees who are not directly connected with production form is one of the most striking characteristics of the iron and steel industry. It will be noted that there is a considerable divergence between the districts in the proportion of employees in the general occupation group. This arises from the fact that this group is largest in the very large modern establishments, where the functions are highly specialized and where mechanical methods of production require a large force for power production, repairs, and yard transportation. For this reason the Pittsburgh and the Great Lakes and Middle West districts, where most of the large, highly developed plants are located, have the largest proportion of employees in the general occupations, and leaving out of consideration the Pacific Coast district, the Eastern district, where puddling mills and small rolling mills are numerous, has the smallest percentage in this group. The tendency of the industry is altogether in the direction of increasing the proportion of employees in the general occupation group through the extension of mechanical methods of production and through increased specialization of occupations. This is exemplified in the fact that in one of the most modern

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plants in the country the employees in the general occupation group form more than 60 per cent of the entire labor force. In this connection it should be noted that all the common laborers specifically charged to a department in the reports of each company have been classified with the productive occupation group for that department.

The distribution of the employees by departments as well as the relative proportions of employees in the productive and in the general occupation groups in each department are shown in the table which follows:

NUMBER OF PLANTS REPORTED AND NUMBER AND PER CENT OF EMPLOYEES IN PRODUCTIVE AND IN GENERAL OCCUPATIONS FOR WHOM DATA ARE REPORTED, BY DEPARTMENTS.

Departments.	Number of plants.	Number of employees in—			Per cent of employees in each department in—		Per cent of employees in each department.
		Productive occupations.	General occupations.	All occupations.	Productive occupations.	General occupations.	
Producing departments:							
Blast furnaces	156	24,722	6,632	31,354	78.8	21.2	18.2
Bessemer converters	24	4,927	691	5,618	87.7	12.3	3.3
Open-hearth furnaces	80	12,421	2,197	14,618	85.0	15.0	8.5
Puddling mills	47	6,447	314	6,761	95.4	4.6	3.9
Crucible furnaces	11	633	95	728	87.0	13.0	.4
Blooming mills	51	4,485	1,269	5,754	77.9	22.1	3.3
Plate mills	34	5,193	748	5,941	87.4	12.6	3.4
Standard rail mills	10	3,584	942	4,526	79.2	20.8	2.6
Structural, light rail, and other shape mills	16	3,160	332	3,492	90.5	9.5	2.0
Miscellaneous mechanical mills	27	2,869	403	3,272	87.7	12.3	1.9
Bar mills	115	16,148	1,178	17,326	93.2	6.8	10.0
Garrett rod mills	19	1,915	541	2,456	78.0	22.0	1.4
Miscellaneous rod mills	11	864	.....	864	100.0	.....	.5
Tube mills	12	4,095	157	4,252	96.3	3.7	2.5
Total, producing departments	.....	91,463	15,499	106,962	85.5	14.5	61.9
Power, mechanical, and yard force:							
Steam, gas, and water	.....	.....	6,037	6,037	.....	100.0	3.5
Yard and transportation	.....	.....	22,855	22,855	.....	100.0	13.2
Electric power and repairs	.....	.....	3,221	3,221	.....	100.0	1.9
Shops	.....	.....	22,588	22,588	.....	100.0	13.1
Mechanical repairs	.....	.....	3,864	3,864	.....	100.0	2.2
Shipping	.....	.....	4,618	4,618	.....	100.0	2.7
Miscellaneous	.....	.....	2,561	2,561	.....	100.0	1.5
Total, power, mechanical, and yard force	.....	.....	65,744	65,744	.....	100.0	38.1
Grand total	.....	91,463	81,243	172,706	53.0	47.0	100.0

A truer understanding of the relative importance of the different departments of the industry in furnishing opportunities for employment would be given if it were possible to apportion the work done by the power, mechanical, and yard force properly among the different departments. This is impossible in a wage presentation because the employees included under the head of power, mechanical, and yard force do not work for specific departments, but work as they are needed for each in turn and can therefore be charged only against the plant as a whole. Some comment, however, will greatly aid in securing a correct understanding of the significance of this table. In the first place, the blast furnaces are in large part operated as separate

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productive and administrative units, and the employees engaged in power generation and mechanical work for them are all included under the head of general occupations, except in the large plants having blast furnaces, steel works, and rolling mills operated as a single unit, in which case a part of the work of the power, mechanical, and yard force would be done for the blast furnaces. An apportionment of this work, however, would not greatly increase the relative importance of the blast furnaces as employers of labor. The same statement applies with even greater exactness to the puddling mills and crucible furnaces, though both these groups are affected by the fact that a larger proportion of defective wage reports were excluded for them than for any other departments. For the tube mills, on the other hand, which as a rule form a part of large and highly organized plants, the greater part of the repair force, etc., are included in the power, mechanical, and yard force. Taking these facts into consideration it will be seen that while the blast-furnace department is decidedly the largest single producing department, it is but slightly larger than the yard and transportation or the shop department, the latter, it must be remembered, including only the repair shops and not those manufacturing for the trade, while the entire power, mechanical, and yard force has more than twice as many employees as the blast furnaces.

The general situation, however, as regards relative number of employees in the different lines of work will be more easily grasped from the following table, in which the facts are more simply presented under a smaller number of groups:

NUMBER OF PLANTS REPORTED AND NUMBER AND PER CENT OF EMPLOYEES IN PRODUCTIVE AND IN GENERAL OCCUPATIONS FOR WHOM DATA ARE REPORTED, BY BRANCHES OF INDUSTRY.

Branches of industry.	Number of plants.	Number of employees in—			Per cent of employees in each department in—		Per cent of employees in each department.
		Productive occupations.	General occupations.	All occupations.	Productive occupations.	General occupations.	
Blast furnaces	156	24,722	6,632	31,354	78.8	21.2	18.2
Steel works and rolling mills:							
Bessemer converters	24	4,927	691	5,618	87.7	12.3	3.3
Open-hearth furnaces	80	12,421	2,197	14,618	85.0	15.0	8.5
Puddling mills and crucible furnaces	58	7,080	409	7,489	94.5	5.5	4.3
Rolling mills	212	38,218	5,413	43,631	87.6	12.4	25.3
Tube mills	12	4,095	157	4,252	96.3	3.7	2.5
Total, steel works and rolling mills	212	66,741	8,867	75,608	88.3	11.7	43.8
Power, mechanical, and yard force	168	.....	65,744	65,744	.....	100.0	38.1
Grand total	[1] 338	91,463	81,243	172,706	53.0	47.0	100.0

[1] Actual number of plants. The total number of plants can not be obtained by simple addition of the number of plants having the specified departments, as many plants have two or more departments. For example, many plants with blast furnaces have also steel works and rolling mills. See table, p. xviii.

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Some comment is necessary in order to bring out the significance of the facts shown in this table. There are three primary divisions of the iron and steel industry; first, the production of pig iron in the blast furnaces, second, the refining and conversion of the greater part of this pig iron into steel or puddled iron in the Bessemer converters, open-hearth, or crucible furnaces, or puddling mills, and finally the mechanical working and shaping of this material in the rolling and tube mills.

It will be seen from the above table that the production of pig iron affords employment to 31,354, or 18.2 per cent, of the 172,706 employees in the industry, and that of this number only 78.8 per cent were directly engaged in production. For the production of steel and puddled iron, 27,725 employees, or 16.1 per cent of the total number were required, of whom approximately 90 per cent were directly engaged in production. Of these, 14,618 were employed in the open-hearth furnaces, which during recent years has become the most important steel-making process. In the rolling mills and tube mills together were 47,883 employees, or 27.8 per cent of the total number, of whom approximately 90 per cent were directly engaged in production. The largest single group, however, including 65,744 employees, or 38.1 per cent, were only very indirectly concerned with production, their work being altogether devoted to repairs, power generation, and the disposition of the products.

EARNINGS, BY DEPARTMENTS.

More than one-half, or 56.48 per cent, of the 172,706 employees included in this report earned 16 and under 25 cents per hour; almost one-fifth, 19.92 per cent, earned less than 16 cents per hour; almost exactly one-half, 49.69 per cent, earned less than 18 cents per hour; three-fourths, 76.40 per cent, earned less than 25 cents per hour; 97.45 per cent earned less than 50 cents per hour; and 2.55 per cent earned 50 cents and over per hour.

The summary which follows shows by means of cumulative percentages the classified earnings for each of the principal branches of the industry.

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PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY BRANCHES OF INDUSTRY.

Branches of industry.	Normal number of employees.	Per cent of employees earning per hour—			
		Under 14 cents.	Under 18 cents.	Under 25 cents.	Under 50 cents.
Blast furnaces	31,354	16.29	65.96	92.30	99.94
Steel works and rolling mills:					
Bessemer converters	5,618	1.21	47.03	73.64	95.64
Open-hearth furnaces	14,618	9.37	48.80	76.25	98.54
Puddling mills and crucible furnaces	7,489	5.35	27.89	48.54	94.26
Rolling mills	43,631	5.74	40.25	67.55	98.03
Tube mills	4,252	3.01	47.81	88.29	97.77
Total, steel works and rolling mills	75,608	5.91	41.61	68.97	94.68
Power, mechanical, and yard force	65,744	6.52	51.22	77.36	99.46
Grand total	172,706	8.03	49.69	76.40	97.45

Comparing first the two primary divisions of the industry, the blast furnaces and the steel works and rolling mills, wide differences are seen to exist in the general level and range of earnings. This difference is marked in every group shown above, but particularly in the highest and lowest. Nearly three times as large a proportion of the employees in blast furnaces were reported as earning under 14 cents per hour as in the steel works and rolling mills, the percentages being 16.29 and 5.91, respectively. In the blast furnaces only 0.06 per cent of all the employees earned as much as 50 cents per hour, while in the steel works and rolling mills 5.32 per cent were earning 50 cents and over per hour. Of the subdivisions of the steel works and rolling mills, the puddling mills and crucible furnaces show the highest general level of earnings, although the rolling mills have the largest proportion earning 50 cents and over per hour. The tube mills show the lowest general level of earnings of any of the subdivisions, the range being unusually narrow, although in the open-hearth furnaces there is a very large proportion of employees, for the most part boys, earning less than 14 cents per hour.

A more exact understanding of the range and distribution of earnings will be obtained from the following table, which shows in detail for all of the departments of the industry the number and per cent of employees earning each classified amount per hour. It will be noted that in this table the various types of rolling mills are shown separately, and that the power, mechanical, and yard force is subdivided into its constituent departments. The first section of the table shows numbers and the second section percentages. It will be noted that the average net earnings per hour were not computed except for the employees in productive occupations, on account of the great amount of work and time involved.

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AVERAGE EARNINGS PER HOUR AND NUMBER AND PER CENT OF EMPLOYEES

Marginal number.	Departments.	Number of plants.	Normal number of employees.	Average earnings per hour.
	Employees in productive occupations:			
1	Blast furnaces	156	24,722	0.172
2	Bessemer converters	24	4,927	.232
3	Open-hearth furnaces	80	12,421	.219
4	Puddling mills	47	6,447	.274
5	Crucible furnaces	11	633	.265
6	Blooming mills	51	4,435	.255
7	Plate mills	34	5,193	.255
8	Standard rail mills	10	3,584	.228
9	Structural, light rail, and other shape mills	16	3,160	.216
10	Miscellaneous mechanical mills	27	2,869	.237
11	Bar mills	115	16,148	.271
12	Garrett rod mills	19	1,915	.302
13	Miscellaneous rod mills	11	864	.269
14	Tube mills	12	4,095	.205
	Total, productive occupations	.....	91,463	.223
	Employees in general occupations:			
15	Blast furnaces	153	6,632	.....
16	Bessemer converters	24	691	.....
17	Open-hearth furnaces	67	2,197	.....
18	Puddling mills	34	314	.....
19	Crucible furnaces	11	95	.....
20	Blooming mills	48	1,269	.....
21	Plate mills	31	748	.....
22	Standard rail mills	10	942	.....
23	Structural, light rail, and other shape mills	13	332	.....
24	Miscellaneous mechanical mills	23	403	.....
25	Bar mills	76	1,178	.....
26	Garrett rod mills	19	541	.....
27	Miscellaneous rod mills	.....	.....	.....
28	Tube mills	11	157	.....
	Total, general occupations	.....	15,499	.....
	Power, mechanical, and yard force:			
29	Steam, gas, and water	.....	6,037	.....
30	Yard and transportation	.....	22,855	.....
31	Electric power and repairs	.....	3,221	.....
32	Shops	.....	22,588	.....
33	Mechanical repairs	.....	3,864	.....
34	Shipping	.....	4,618	.....
35	Miscellaneous	.....	2,561	.....
	Total, power, mechanical, and yard force	.....	65,744	.....
	Grand total	.....	172,706	.....

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EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DEPARTMENTS—Concluded.

Per cent of employees earning each classified amount per hour.												Marginal number.
Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 and under 60 cents.	60 and under 70 cents.	70 cents and over.	
5.57	12.26	16.96	37.51	13.07	10.27	2.92	1.32	0.11	0.01	.....	.....	1
.47	.63	13.31	33.18	9.78	14.19	8.79	9.36	5.32	2.23	1.38	1.36	2
3.47	6.98	9.81	29.64	7.93	17.68	9.37	9.19	4.26	.76	.31	.61	3
.79	4.17	12.60	8.75	4.50	14.67	13.94	30.40	4.14	4.92	.31	.81	4
3.48	3.63	7.90	20.22	7.11	19.43	8.69	16.59	6.95	2.84	1.11	2.05	5
2.32	3.66	7.67	27.13	8.05	12.80	9.57	14.36	6.76	4.55	1.87	1.27	6
3.00	4.95	10.21	18.06	9.36	17.27	12.42	12.34	5.35	2.97	1.83	2.23	7
1.56	5.19	14.34	26.84	7.84	19.39	7.17	6.64	5.27	2.65	2.43	.67	8
1.84	.70	15.85	32.22	13.16	12.41	10.41	9.02	1.99	1.17	.57	.66	9
.70	1.01	5.51	36.60	10.84	18.09	8.82	7.77	4.78	3.38	1.08	.43	10
3.03	3.90	9.79	18.15	9.96	17.63	9.99	11.79	6.84	3.76	1.93	3.21	11
.26	3.60	4.54	25.59	10.70	12.17	8.98	9.24	7.15	7.99	5.69	4.07	12
.23	.35	9.26	26.27	8.80	16.55	11.11	13.08	5.21	4.28	1.85	3.01	13
1.20	1.81	5.93	40.24	18.02	21.17	3.74	4.13	1.44	.90	1.39	.02	14
3.11	6.18	11.99	28.17	10.41	14.95	7.89	9.17	3.76	2.15	1.03	1.19	
3.69	6.82	9.65	22.17	17.64	19.84	11.38	8.08	.45	.23	.05	.....	15
.43	1.59	8.10	32.85	18.81	26.63	9.84	1.59	.14	.....	.....	.....	16
1.78	1.46	15.57	23.81	14.70	23.17	12.56	5.55	1.14	.18	.09	.....	17
3.50	7.32	15.92	20.70	7.01	24.20	11.46	7.96	.96	.....	.64	.32	18
1.05	1.05	.....	20.00	10.53	35.79	23.16	8.42	.....	.....	.....	.....	19
1.28	3.55	9.69	34.67	18.91	18.99	7.41	5.36	.16	.....	.....	.....	20
.27	1.60	16.04	34.22	9.36	18.85	12.17	7.35	.....	.13	.....	.....	21
.42	4.56	11.25	31.32	13.80	25.48	11.46	1.59	.....	.11	.....	.....	22
2.41	.....	5.12	57.23	8.13	14.76	10.24	2.11	.....	.....	.....	.....	23
1.49	.99	3.72	29.78	28.29	22.08	9.18	4.47	.....	.....	.....	.....	24
3.74	2.21	14.26	29.12	12.73	16.64	7.89	11.46	.85	.59	.42	.08	25
3.33	5.18	14.60	28.84	22.00	10.54	8.32	4.62	.74	1.11	.37	.37	26
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27
1.27	1.91	1.27	7.64	24.84	49.04	4.46	8.92	.64	.....	.....	.....	28
2.57	4.39	11.08	26.56	16.41	20.70	10.75	6.70	.49	.22	.09	.03	
.20	1.99	9.47	39.56	21.75	20.47	5.58	.88	.05	.....	.06	.....	29
.81	10.19	17.92	52.36	5.18	7.50	4.20	1.75	.02	.....	.05	(1)	30
1.71	1.12	2.83	8.94	9.87	32.07	30.58	12.79	.09	.....	.....	.....	31
1.89	2.88	6.25	15.37	11.11	16.58	17.98	22.62	3.92	1.01	.31	.08	32
.21	.70	12.16	10.95	17.13	33.33	17.18	7.48	.23	.60	.....	.03	33
.39	4.24	14.83	44.24	18.49	13.21	3.64	.89	.04	.02	.....	.....	34
3.32	5.43	20.19	37.41	17.77	10.35	4.10	1.17	.27	.....	.....	.....	35
1.20	5.32	11.93	32.76	11.10	15.05	11.07	9.63	1.39	.38	.13	.03	
2.34	5.69	11.89	29.77	11.21	15.50	9.36	9.13	2.57	1.30	.60	.65	

(1) Less than one-hundredth of 1 per cent.

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In productive occupations some employees in every department were earning less than 12 cents per hour. The proportion earning less than 12 cents was 5.57 per cent in the blast furnace department, 3.48 per cent in the crucible furnaces, 3.47 per cent in the open-hearth furnaces, 3.03 per cent in the bar mills, and 3 per cent in the plate mills. Of the total for productive occupations 3.11 per cent earned less than 12 cents per hour. These employees were in large part boys, but in the Southern district particularly a large number of adult males were receiving less than 12 cents per hour.

In every department with the exception of the blast furnace department a few employees in productive occupations earned 70 cents and over per hour. The proportion earning 70 cents and over was 4.07 per cent in the rod mills, 3.21 per cent in the bar mills, and 1.19 per cent for the total of all departments.

Considering the total number of employees included in this report, 57 per cent more employees earned less than 14 cents per hour than earned 40 cents and over; less than 14 cents per hour was earned by 8.03 per cent of all employees and 40 cents and over per hour was earned by 5.12 per cent of all employees.

It will be noted that in the general occupations and in the power, mechanical, and yard force the general level of earnings is lower and the range smaller than in the productive occupations. The shops, however, show both a high level of earnings and a very wide range with a large number in the groups earning 30 cents and over per hour.

In order to present the general situation as regards hourly earnings in the simplest form, the following tables have been prepared, the first of which needs no comment, save to point out the very low level of earnings in the blast furnaces as compared with the steel works and rolling mills.

The second of these tables merely separates the employees into three groups according to earnings. The group earning under 18 cents per hour represents almost altogether unskilled labor; the group earning 18 and under 25 cents per hour represents the semi-skilled employees, and the group earning 25 cents and over per hour represents skilled employees.

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PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY BRANCHES OF INDUSTRY.

Branches of industry.	Number of plants.	Normal number of employees.	Per cent of employees earning each classified amount per hour.											
			Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Blast furnaces	156	31,354	5.18	11.11	15.41	34.26	14.04	12.30	4.71	2.75	0.18	0.05	0.01	.....
Steel works and rolling mills:														
Bessemer converters	24	5,618	.46	.75	12.67	33.14	10.89	15.72	8.92	8.40	4.68	1.96	1.21	1.19
Open-hearth furnaces	80	14,618	3.22	6.15	10.67	28.76	8.96	18.50	9.85	8.65	3.79	.67	.27	.52
Puddling mills and crucible furnaces	58	7,489	1.13	4.22	12.18	10.36	4.90	15.74	13.51	28.01	4.19	4.47	.39	.88
Rolling mills	212	43,631	2.27	3.48	10.14	24.37	10.54	16.76	9.85	10.42	5.21	3.21	1.74	2.03
Tube mills	12	4,252	1.20	1.81	5.76	39.04	18.27	22.20	3.76	4.30	1.41	.87	1.34	.02
Total, steel works and rolling mills	[1] 212	75,608	2.14	3.77	10.39	25.31	10.13	17.23	9.80	11.33	4.58	2.62	1.26	1.45
Power, mechanical, and yard force	168	65,744	1.20	5.32	11.93	32.76	11.10	15.06	11.07	9.63	1.39	.38	.13	.03
Grand total	[1] 338	172,706	2.34	5.69	11.89	29.77	11.21	15.50	9.36	9.13	2.57	1.30	.60	.65

[1] Actual number of plants. The total number of plants can not be obtained by simple addition of the number of plants having the specified departments, as many plants have two or more departments.

NUMBER AND PER CENT OF EMPLOYEES WHOSE EARNINGS FALL WITHIN CERTAIN SPECIFIED WAGE GROUPS, BY DEPARTMENTS.

Departments.	Normal number of employees.	Average earnings per hour.	Number of employees earning per hour—			Per cent of employees earning per hour—		
			Under 18 cents.	18 and under 25 cents.	25 cents and over.	Under 18 cents.	18 and under 25 cents.	25 cents and over.
Employees in productive occupations:								
Blast furnaces	24,722	$0.172	17,875	5,771	1,076	72.30	23.34	4.36
Bessemer converters	4,927	.232	2,345	1,181	1,401	47.59	23.97	28.44
Open-hearth furnaces	12,421	.219	6,197	3,181	3,043	49.90	25.61	24.50
Puddling mills	6,447	.274	1,696	1,236	3,515	26.31	19.17	54.52
Crucible furnaces	633	.265	223	168	242	35.23	26.54	38.22
Blooming mills	4,485	.255	1,829	935	1,721	40.78	20.85	38.38
Plate mills	5,193	.255	1,881	1,383	1,929	36.22	26.63	37.14
Standard rail mills	3,584	.228	1,718	976	890	47.93	27.23	24.83
Structural, light rail, and other shape mills	3,160	.216	1,599	808	753	50.61	25.57	23.83
Miscellaneous mechanical mills	2,869	.237	1,257	830	782	43.82	28.93	27.26
Bar mills	16,148	.271	5,628	4,463	6,057	34.85	27.64	37.51
Garrett rod mills	1,915	.302	651	438	826	33.99	22.87	43.12
Miscellaneous rod mills	864	.269	312	219	333	36.11	25.35	38.54
Tube mills	4,095	.205	2,014	1,605	476	49.18	39.19	11.62
Total, productive occupations	91,463	.223	45,228	23,190	23,045	49.45	25.35	25.20
Employees in general occupations:								
Blast furnaces	6,632	.....	2,807	2,496	1,339	42.33	37.48	20.19
Bessemer converters	691	.....	297	314	80	42.98	45.44	11.58
Open-hearth furnaces	2,197	.....	936	832	429	42.60	37.87	19.53
Puddling mills	314	.....	149	98	67	47.45	31.21	21.34
Crucible furnaces	95	.....	21	44	30	22.11	46.32	31.58
Blooming mills	1,269	.....	624	481	164	49.17	37.90	12.92
Plate mills	748	.....	390	211	147	52.14	28.21	19.65
Standard rail mills	942	.....	448	370	124	47.56	39.28	13.16
Structural, light rail, and other shape mills	332	.....	215	76	41	64.76	22.89	12.35
Miscellaneous mechanical mills	403	.....	145	203	55	35.98	50.37	13.65
Bar mills	1,178	.....	581	346	251	49.32	29.37	21.31
Garrett rod mills	541	.....	281	176	84	51.94	32.53	15.53
Miscellaneous rod mills	.....	.....	.....	.....	.....	.....	.....	.....
Tube mills	157	.....	19	116	22	12.10	73.89	14.01
Total, general occupations	15,499	.....	6,913	5,753	2,833	44.60	37.12	18.28

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NUMBER AND PER CENT OF EMPLOYEES WHOSE EARNINGS FALL WITHIN CERTAIN SPECIFIED WAGE GROUPS, BY DEPARTMENTS—Concluded.

Departments.	Normal number of employees.	Average earnings per hour.	Number of employees earning per hour—			Per cent of employees earning per hour—		
			Under 18 cents.	18 and under 25 cents.	25 cents and over.	Under 18 cents.	18 and under 25 cents.	25 cents and over.
Power, mechanical, and yard force:								
Steam, gas, and water	6,037	.....	3,092	2,549	396	51.22	42.22	6.56
Yard and transportation	22,855	.....	18,580	2,899	1,376	81.30	12.68	6.02
Electric power and repairs	3,221	.....	470	1,351	1,400	14.59	41.94	43.46
Shops	22,588	.....	5,960	6,256	10,372	26.39	27.70	45.92
Mechanical repairs	3,864	.....	928	1,950	986	24.02	50.47	25.52
Shipping	4,618	.....	2,942	1,464	212	63.71	31.70	4.59
Miscellaneous	2,561	.....	1,699	720	142	66.34	28.11	5.54
Total, power, mechanical, and yard force	65,744	.....	33,671	17,189	14,884	51.22	26.15	22.64
Grand total	172,706	.....	85,812	46,132	40,762	49.69	26.71	23.60

Almost exactly one-half, 49.69 per cent, of the 172,706 employees earned less than 18 cents per hour and were practically all unskilled laborers; 26.71 per cent of all employees earned 18 and under 25 cents per hour and were largely semiskilled employees; and 23.60 per cent earned 25 cents and over per hour and were skilled employees.

In the productive occupations of the blast furnace department 72.30 per cent of all employees earned less than 18 cents per hour and were practically all unskilled laborers; 23.34 per cent earned 18 and under 25 cents per hour and were largely semiskilled employees; and only 4.36 per cent earned 25 cents and over per hour and were skilled employees.

The lowest per cent of employees in productive occupations earning less than 18 cents per hour and the highest per cent earning 25 cents and over per hour were in the puddling mills; less than 18 cents was earned by 26.31 per cent, and 25 cents and over by 54.52 per cent of the employees in that department.

In the electric power and repairs and the shops departments the percentage of skilled employees earning 25 cents and over per hour was unusually large, but in the other departments of the power, mechanical, and yard force, except mechanical repairs, the proportion of skilled workmen was extremely small and that of unskilled workmen very large.

The summary which follows shows in cumulative form the per cent of employees earning less than each specified amount per hour.

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PER CENT OF EMPLOYEES WHOSE EARNINGS PER HOUR FALL BELOW CERTAIN SPECIFIED AMOUNTS, BY DEPARTMENTS.

Departments.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning per hour—							
			Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
Employees in productive occupations:										
Blast furnaces	24,722	$0.172	17.83	34.79	72.30	85.37	95.64	98.56	99.88	99.99
Bessemer converters	4,927	.232	1.10	14.41	47.59	57.37	71.56	80.35	89.71	95.03
Open-hearth furnaces	12,421	.219	10.45	20.26	49.90	57.83	75.51	84.88	94.07	98.33
Puddling mills	6,447	.274	4.96	17.56	26.31	30.81	45.48	59.42	89.82	98.96
Crucible furnaces	633	.265	7.11	15.01	35.23	42.34	61.77	70.46	87.05	94.00
Blooming mills	4,485	.256	5.96	13.65	40.78	48.83	61.63	71.20	85.56	92.32
Plate mills	5,193	.255	7.95	18.16	36.22	45.58	62.85	75.27	87.61	92.96
Standard rail mills	3,584	.228	6.75	21.09	47.93	55.77	75.16	82.33	88.97	94.24
Structural, light rail, and other shape mills	3,160	.216	2.54	18.39	50.61	63.77	76.18	86.59	95.61	97.60
Miscellaneous mechanical mills	2,869	.237	1.71	7.22	43.82	54.66	72.75	81.57	89.34	94.12
Bar mills	16,148	.271	6.93	16.70	34.85	44.86	62.49	72.48	84.26	91.10
Garrett rod mills	1,915	.302	3.86	8.40	33.99	44.69	56.86	65.84	75.08	82.23
Miscellaneous rod mills	864	.269	.58	9.84	36.11	44.91	61.46	72.57	85.65	90.86
Tube mills	4,095	.205	3.01	8.94	49.18	67.20	88.37	92.11	96.24	97.68
Total, productive occupations	91,463	.223	9.29	21.28	49.45	59.86	74.81	82.70	91.87	95.63
Employees in general occupations:										
Blast furnaces	6,632	.....	10.51	20.16	42.33	59.97	79.81	91.19	99.28	99.73
Bessemer converters	691	.....	2.03	10.13	42.98	61.79	88.42	98.26	99.86	100.00
Open-hearth furnaces	2,197	.....	3.23	18.80	42.60	57.31	80.47	93.04	98.59	99.73
Puddling mills	314	.....	10.83	26.75	47.45	54.46	78.66	90.13	98.09	99.04
Crucible furnaces	95	.....	2.11	2.11	22.11	32.63	68.42	91.58	100.00	100.00
Blooming mills	1,269	.....	4.81	14.50	49.17	68.09	87.08	94.48	99.84	100.00
Plate mills	748	.....	1.87	17.91	52.14	61.50	80.35	92.51	99.87	99.87
Standard rail mills	942	.....	4.99	16.24	47.56	61.36	86.84	98.30	99.89	99.89
Structural, light rail, and other shape mills	332	.....	2.41	7.53	64.76	72.89	87.65	97.89	100.00	100.00
Miscellaneous mechanical mills	403	.....	2.48	6.20	35.98	64.27	86.35	95.53	100.00	100.00
Bar mills	1,178	.....	5.94	20.20	49.32	62.05	78.69	86.59	98.05	98.90
Garrett rod mills	541	.....	8.50	23.11	51.94	73.94	84.47	92.79	97.41	98.15
Miscellaneous rod mills	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tube mills	157	.....	3.18	4.46	12.10	36.94	85.99	90.45	99.36	100.00
Total, general occupations	15,499	.....	6.96	18.05	44.60	61.02	81.72	92.47	99.17	99.66
Power, mechanical, and yard force:										
Steam, gas, and water	6,037	.....	2.19	11.66	51.22	72.97	93.44	99.02	99.90	99.95
Yard and transportation	22,855	.....	11.01	28.93	81.30	86.48	93.98	98.18	99.93	99.94
Electric power and repairs	3,221	.....	2.88	5.65	14.59	24.46	50.54	87.12	99.91	100.00
Shops	22,588	.....	4.77	11.02	26.39	37.50	54.08	72.06	94.68	98.60
Mechanical repairs	3,864	.....	.91	13.07	24.02	41.15	74.43	91.67	99.15	99.38
Shipping	4,618	.....	4.63	19.47	63.71	82.20	95.41	99.05	99.94	99.98
Miscellaneous	2,561	.....	8.75	28.93	66.34	84.11	94.46	98.56	99.73	100.00
Total, power, mechanical, and yard force	65,744	.....	6.52	18.45	51.22	62.31	77.36	88.43	98.07	99.46
Grand total	172,706	.....	8.03	19.92	49.69	60.90	76.40	85.76	94.88	97.45

Nearly one-twelfth of all employees earned less than 14 cents per hour, and almost one-fifth, 19.92 per cent, of all employees earned less than 16 cents per hour. In 10 of the 14 departments at least one-eighth of all employees in productive occupations earned less than 16 cents per hour; in 3 of the 14 departments at least one-fifth of all employees earned less than 16 cents per hour, and in 1 department more than one-third ot all employees earned less than 16

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cents per hour. In the general occupations the most noticeable feature is the very small percentage in all the departments earning 40 cents and over per hour.

EARNINGS, BY DEPARTMENTS AND DISTRICTS.

In the sections of this report in which the data are discussed by departments, earnings in the several districts are compared. Earnings for the whole iron and steel industry can not be summarized by districts with fairness for the reason that in certain departments a much larger proportion of unskilled labor is employed than in others, and the earnings for the department are therefore less; and the proportion of departments employing large numbers of unskilled men, and therefore normally having low earnings, varies materially in the several districts. Thus a comparison of earnings in the industry as a whole in the Pittsburgh district with earnings in the Southern district would be decidedly unfair for the reason that in the Southern district the great bulk of the plants reported are blast furnaces, and by far the greater part of the labor is therefore unskilled, while in the Pittsburgh district every department of the iron and steel industry is represented; and in other departments a much smaller proportion of the employees are unskilled than is the case in blast furnaces. Within a department a comparison of the earnings in the various districts is upon a fair basis. In these tables the total for all districts includes all plants, but data as to earnings for a department are not shown for any district from which only one plant reported in the department in question. Data for the Pacific Coast district are entirely omitted for the reason that only a very few plants are located in that district. It should be borne in mind, however, that all plants in all districts are included in the column "Total, all districts."

AVERAGE EARNINGS PER HOUR OF EMPLOYEES IN PRODUCTIVE OCCUPATIONS IN EACH DEPARTMENT, BY DISTRICTS.

Departments.	New England.	Eastern.	Pittsburgh.	Great Lakes and Middle West.	Southern.	Total, all districts.
Blast furnaces	$0.172	$0.153	$0.186	$0.183	$0.138	$0.172
Bessemer converters	.....	.....	.241	.226	.....	.232
Open-hearth furnaces	.221	.191	.230	.220	.196	.219
Puddling mills	.219	.264	.291	.322	.262	.274
Crucible furnaces	.267	.267	.248	.....	.....	.265
Blooming mills	.222	.230	.276	.235	.211	.255
Plate mills	.....	.244	.266	.243	.....	.255
Standard rail mills	.....	.205	.228	.235	.....	.228
Structural, light rail, and other shape mills	.....	.216	.232	.192	.....	.216
Miscellaneous mechanical mills	.....	.....	.239	.235	.....	.237
Bar mills	.252	.247	.278	.280	.214	.271
Garrett rod mills	.....	.287	.324	.300	.....	.302
Miscellaneous rod mills	.263	.....	.269	.267	.....	.269
Tube mills	.....	.....	.204	.....	.....	.205

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In practically every department the average earnings by districts varied materially.

In blast furnaces the district with the lowest average was the Southern with 13.8 cents and the second lowest the Eastern with 15.3 cents. The New England district was next in order with 17.2 cents, and the Great Lakes and Middle West district and the Pittsburgh district were on practically the same level, the average being 18.3 and 18.6 cents, respectively.

In the open-hearth department the average ranged from 19.1 cents in the Eastern district to 23 cents in the Pittsburgh district.

In puddling mills the greatest variations are shown; the lowest average, 21.9 cents, is for the New England district, and the highest average, 32.2 cents, is for the Great Lakes and Middle West district, the average earnings in the latter district being about 47 per cent higher than in the former district.

It is possible to compare earnings in all five of the districts in each of five departments—blast furnaces, open-hearth furnaces, and puddling, blooming, and bar mills.

The Southern district shows lower average earnings than any of the other four districts in blast furnaces, blooming mills, and bar mills; lower than any other except the Eastern in open hearth; and lower than any other except the New England in puddling.

The Pittsburgh district shows higher average earnings than any of the other four districts in blast furnaces, open-hearth furnaces, and blooming mills and higher than any other except the Great Lakes and Middle West district in puddling and bar mills.

It is possible to compare earnings in the Eastern, the Pittsburgh, and the Great Lakes and Middle West districts in nine departments. In seven of those nine departments the earnings in the Eastern district were lower than in either of the other two districts, and in the other two departments the earnings in the Eastern district were lower than in the Pittsburgh district. In three of the nine departments the earnings in the Great Lakes and Middle West district were higher than in either the Eastern or the Pittsburgh district. In six of the nine departments the earnings in the Pittsburgh district were higher than in either the Eastern district or the Great Lakes and Middle West district.

It is possible to compare earnings in the Pittsburgh district and in the Great Lakes and Middle West district in 12 of the 14 departments. In 9 of those departments the earnings were lower in the Great Lakes and Middle West district than in the Pittsburgh district.

The summary which follows shows by districts the per cent of employees in each department earning less than 18 cents per hour. Data for a department are not shown for any district from which only one plant reported, and data for the Pacific Coast district are

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entirely omitted owing to the small number of plants in that section of the country. All plants and all districts, however, are included in the column "Total, all districts."

PER CENT OF EMPLOYEES IN EACH DEPARTMENT EARNING LESS THAN 18 CENTS PER HOUR, BY DISTRICTS.

Departments.	New England.	Eastern.	Pittsburgh.	Great Lakes and Middle West.	Southern.	Total, all districts.
Employees in productive occupations:						
Blast furnaces	73.78	90.95	61.40	63.80	90.66	72.30
Bessemer converters	.....	.....	42.59	51.97	41.32	47.59
Open-hearth furnaces	45.10	57.98	44.46	52.39	58.82	49.89
Puddling mills	58.78	27.59	15.68	14.95	40.54	26.31
Crucible furnaces	33.33	21.03	49.08	.....	.....	35.23
Blooming mills	22.58	45.23	34.11	49.85	54.81	40.78
Plate mills	.....	37.41	33.82	38.46	.....	36.22
Standard rail mills	.....	53.39	48.18	45.63	.....	47.94
Structural, light rail, and other shape mills	.....	50.94	42.09	63.63	.....	50.60
Miscellaneous mechanical mills	.....	.....	44.26	43.37	.....	43.81
Bar mills	46.32	40.82	31.00	32.98	62.31	34.87
Garrett rod mills	.....	26.40	32.20	35.85	.....	33.99
Miscellaneous rod mills	37.25	.....	34.98	37.37	20.00	36.11
Tube mills	.....	81.42	49.83	.....	.....	49.18
Total, productive occupations	48.20	54.31	43.16	49.57	78.38	49.45
Employees in general occupations:						
Blast furnaces	55.93	65.04	27.79	31.29	70.48	42.33
Bessemer converters	.....	71.79	39.66	35.71	69.70	42.96
Open-hearth furnaces	26.21	59.77	27.88	37.76	61.29	42.60
Puddling mills	47.50	52.51	32.39	54.17	.....	47.45
Crucible furnaces	36.00	6.25	25.81	28.57	.....	22.11
Blooming mills	38.46	72.30	33.77	48.13	65.18	49.17
Plate mills	.....	75.78	34.01	43.21	.....	52.14
Standard rail mills	.....	56.29	34.04	40.34	83.61	47.56
Structural, light rail, and other shape mills	.....	51.35	44.74	73.97	.....	64.76
Miscellaneous mechanical mills	.....	33.33	36.00	35.23	100.00	35.96
Bar mills	47.06	47.74	62.89	31.75	79.71	49.32
Garrett rod mills	.....	62.86	41.73	48.92	76.47	51.94
Miscellaneous rod mills	.....	.....	.....	.....	.....	.....
Tube mills	.....	50.00	10.07	.....	.....	12.10
Total, general occupations	42.54	61.57	32.62	38.15	70.77	44.60
Power, mechanical, and yard force:						
Steam, gas, and water	25.16	62.00	47.93	57.40	70.83	51.22
Yard and transportation	73.28	81.32	81.29	79.60	93.37	81.30
Electric power and repairs	.....	35.44	12.16	12.83	10.66	14.59
Shops	20.87	37.40	25.50	23.63	29.55	26.39
Mechanical repairs	11.63	22.54	28.36	12.31	27.80	24.02
Shipping	73.77	82.48	61.57	58.43	86.89	63.71
Miscellaneous	46.15	92.00	50.30	73.38	97.06	66.34
Total, power, mechanical, and yard force	41.85	59.54	50.65	47.71	68.26	51.22
Grand total	45.79	56.43	45.68	47.48	72.88	49.60

Comparing first the employees in the productive occupations, in several of the departments the districts vary materially in the proportion of employees earning less than 18 cents per hour, while within a few of the departments there is an unusual agreement.

The puddling department shows the greatest variation. In that department less than 18 cents per hour was earned by 58.78 per cent of the employees in productive occupations in the New England district, 40.54 per cent in the Southern district, 27.59 per cent in the Eastern district, 15.68 per cent in the Pittsburgh district, and 14.95 per cent in the Great Lakes and Middle West district.

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The plate mills show but slight variations by districts. In that department less than 18 cents per hour was earned by 38.46 per cent of the employees in productive occupations in the Great Lakes and Middle West district, 37.41 per cent in the Eastern district, and 33.82 per cent in the Pittsburgh district.

In the five departments in which earnings may be compared in all five of the districts, the Southern district shows a larger per cent of employees earning less than 18 cents per hour than any of the other four districts in open-hearth furnaces, blooming mills, and bar mills; larger than any other except the Eastern in blast furnaces; and larger than any other except New England in puddling mills.

The Pittsburgh district shows a smaller per cent of employees earning less than 18 cents per hour than any of the other four districts in blast furnaces, open-hearth furnaces, and bar mills; smaller than any other except the Great Lakes and Middle West district in puddling mills; and smaller than any other except the New England in blooming mills.

Earnings may be compared in the Pittsburgh district with earnings in the Great Lakes and Middle West district in 12 departments. In 9 of these 12 departments the per cent of employees earning less than 18 cents per hour was greater in the Great Lakes and Middle West district than in the Pittsburgh district.

Comparing now the departments of the power, mechanical, and yard force in the different districts, it is seen that in general the variations between the different districts are much less than in the producing departments. This is particularly true in the yard and transportation, electric power and repairs, and shops departments, where there is a remarkably close correspondence of the different districts. The closer correspondence of the Southern district with the other districts in these departments is largely explained by the fact that except for unskilled laborers, the only class of workmen largely earning under 18 cents per hour are the handy men and low-grade mechanics. For this class of labor, for whom there is a large demand in other industries, the plants in the Southern district pay very nearly as much as in the other districts and decidedly more than in the Eastern district. The same condition as regards the more highly skilled mechanics earning 25 cents and over per hour is shown in the table which follows.

The summary which follows shows by districts the per cent of employees in each department earning 25 cents and over per hour. Data for a department are not shown for any district from which only one plant reported, and data for the Pacific Coast district are entirely omitted owing to the small number of plants in that section of the country. All plants and all districts, however, are included in the column "Total, all districts."

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PER CENT OF EMPLOYEES IN EACH DEPARTMENT EARNING 25 CENTS AND OVER PER HOUR, BY DISTRICTS.

Departments.	New England.	Eastern.	Pittsburgh.	Great Lakes and Middle West.	Southern.	Total, all districts.
Employees in productive occupations:						
Blast furnaces	6.42	1.70	5.50	6.12	1.66	4.35
Bessemer converters	.....	.....	36.32	19.57	20.46	28.44
Open-hearth furnaces	23.53	17.28	28.04	24.44	21.64	24.50
Puddling mills	39.08	47.24	70.19	60.56	58.11	54.52
Crucible furnaces	39.01	41.54	34.69	.....	.....	38.23
Blooming mills	30.11	32.57	47.01	26.94	30.96	38.37
Plate mills	.....	33.48	40.79	32.37	.....	37.15
Standard rail mills	.....	21.90	32.26	24.81	.....	24.83
Structural, light rail and other shape mills	.....	19.50	32.48	11.72	.....	23.88
Miscellaneous mechanical mills	.....	.....	28.36	25.25	.....	27.26
Bar mills	35.07	33.59	38.38	40.46	22.10	37.52
Garrett rod mills	.....	44.40	42.72	43.04	.....	43.13
Miscellaneous rod mills	38.56	.....	34.65	40.21	65.00	38.54
Tube mills	.....	9.51	11.35	.....	.....	11.62
Total, productive occupations	31.88	24.52	28.48	25.05	9.58	25.20
Employees in general occupations:						
Blast furnaces	10.17	9.17	23.98	25.16	13.62	20.19
Bessemer converters	.....	.....	11.49	13.03	13.64	11.58
Open-hearth furnaces	25.64	11.99	28.32	19.03	12.37	19.53
Puddling mills	30.00	17.32	30.99	8.33	.....	21.34
Crucible furnaces	20.00	31.25	32.26	71.43	.....	31.58
Blooming mills	3.85	4.69	15.45	14.37	15.18	12.92
Plate mills	.....	10.03	28.62	20.37	.....	19.65
Standard rail mills	.....	3.97	35.46	11.17	7.38	13.16
Structural, light rail, and other shape mills	.....	13.51	15.79	10.96	.....	12.35
Miscellaneous mechanical mills	.....	50.00	8.80	15.53	.....	13.65
Bar mills	38.24	23.87	6.84	33.53	11.59	21.31
Garrett rod mills	100.00	11.43	16.55	13.67	17.65	15.53
Miscellaneous rod mills	.....	.....	.....	.....	.....	.....
Tube mills	.....	30.00	13.67	.....	.....	14.01
Total, general occupations	23.88	11.69	21.55	20.12	13.25	18.28
Power, mechanical, and yard force:						
Steam, gas, and water	10.06	6.99	5.94	6.69	16.67	6.56
Yard and transportation	4.74	3.42	7.16	6.19	.49	6.02
Electric power and repairs	58.97	34.83	40.83	48.95	48.36	43.46
Shops	52.18	40.28	45.44	48.09	46.13	45.92
Mechanical repairs	30.23	37.31	24.54	21.34	30.49	25.52
Shipping	13.11	4.88	3.97	6.93	1.64	4.59
Miscellaneous	7.69	1.18	5.85	7.62	.....	5.54
Total, power, mechanical, and yard force	27.22	20.20	21.19	26.24	20.48	22.64
Grand total	29.86	22.07	24.96	24.96	13.26	23.60

Comparing first the employees in productive occupations, in some departments marked variations and in others unusual agreements are shown in the proportion of employees earning 25 cents and over per hour.

The blast-furnace department shows considerable variation, but the greatest proportion of employees in productive occupations in that department earning 25 cents and over in any district is only 6.42 per cent. Twenty-five cents and over per hour was earned by only 1.66 per cent of the employees in the Southern district, 1.70 per cent in the Eastern district, 5.50 per cent in the Pittsburgh district, 6.12 per cent in the Great Lakes and Middle West district, and 6.42 per cent in the New England district.

The Garrett rod mills show but slight variations by districts. Twenty-five cents and over per hour was earned by 44.40 per cent of

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the employees in productive occupations in the Eastern district, 43.04 per cent in the Great Lakes and Middle West district, and 42.72 per cent in the Pittsburgh district.

Earnings may be compared in all five of the districts in five departments. The districts showing the smallest per cent earning 25 cents and over per hour were the Southern in blast furnaces and in bar mills; the New England, in puddling mills; the Eastern, in open-hearth furnaces; and the Great Lakes and Middle West in blooming mills. The Pittsburgh district shows a larger per cent than any other district earning 25 cents and over per hour in open-hearth furnaces, puddling mills, and blooming mills.

In 8 of the 12 departments in which it is possible to compare the Pittsburgh district and the Great Lakes and Middle West district the per cent earning 25 cents and over per hour was smaller in the Great Lakes and Middle West district than in the Pittsburgh district.

The point developed in the discussion of the preceding table that the wages of workmen in mechanical trades are much more nearly standardized in the different districts than of the employees in the productive occupations, who are dependent almost entirely on the iron and steel industry for employment, is borne out strikingly in the above table. Taking the three departments in which such workmen are chiefly employed, the electric power and repairs, the shops, and the mechanical repairs departments, the close agreement of the different districts in the proportion earning 25 cents and over per hour is remarkable.

EARNINGS OF COMMON LABORERS.

The most satisfactory comparison between the different districts, however, can be made by considering the earnings of the common, unskilled laborers, who, as a rule, have no regular specified duties, but who are shifted from job to job as the occasion may require. For this class the department in which the laborers may be employed has no significance inasmuch as they perform about the same kind of work in all the departments and, furthermore, are frequently shifted from one department to another. This class is of the greatest importance in the industry, not only because of the very large proportion employed, but even more because their wage forms the base rate of the entire industry, above which the wages of the other employees are graded.

In the following table are shown the earnings of the laborers in productive departments in each of the districts. It should be noted that the number shown in the table which follows does not include by any means all the unskilled workmen in the industry, but only those who

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are known in the industry as "common laborers." In addition to these there is an equally large number of workmen, such for example as the stockers in the various departments, who are also unskilled but who have a specified and regular set of duties and who are consequently given a specified occupation designation.

PER CENT OF COMMON LABORERS IN PRODUCING DEPARTMENTS EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS.

Districts.	Number of employees.	Average earnings per hour.	Per cent of laborers earning each classified amount per hour.						
			Under 10 cents.	10 and under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.
New England	468	$0.152	.....	.....	7.05	62.39	30.13	0.43	.....
Eastern	3,746	.140	0.40	2.22	41.99	52.48	2.35	.....	0.56
Pittsburgh	8,598	.165	.....	.19	4.66	10.29	83.66	1.20	.....
Great Lakes and Middle West	5,401	.163	.....	.....	.09	27.22	71.01	1.61	.07
Southern	1,387	.125	3.89	28.41	51.98	15.07	.65	.....	.....
Pacific Coast	20	.222	.....	.....	.....	.....	.....	.....	100.00
Total	19,620	.158	.36	2.51	13.93	24.58	57.42	.98	.23

In the above table the wide variation between the common-labor rates for the different districts is strikingly shown. The Pittsburgh district, for example, shows average earnings per hour 4 cents higher than the rate in the Southern district and 2.5 cents higher than the rate in the Eastern district, and the same proportions hold in regard to the predominant rates in these districts. The Pittsburgh and Great Lakes and Middle West districts were very nearly together, the difference arising chiefly from the larger proportion in the Great Lakes and Middle West district earning less than 16 cents per hour. The Southern district was far below any of the others, with the New England and Eastern districts lying between it and the remaining districts.

In the Southern district all but two-thirds of 1 per cent earned less than 16 cents per hour. In the Eastern district all but 2.91 per cent and in the New England district all but 30.56 per cent earned less than 16 cents, while in the Great Lakes and Middle West district only 27.31 per cent, and in the Pittsburgh district only 15.14 per cent earned less than 16 cents per hour.

Furthermore, in the Southern district 84.28 per cent earned less than 14 cents, which was practically double the proportion earning under 14 cents in the Eastern district and more than ten times greater than the proportion earning less than 14 cents in any of the other districts. Almost one-third of all the laborers in the Southern district earned less than 12 cents per hour, which is many times greater than the proportion in any other district.

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In the table which follows are shown the earnings of the laborers in all departments in each of the districts. In this table the average earnings per hour are not shown on account of the large amount of work involved in this calculation.

PER CENT OF COMMON LABORERS IN ALL DEPARTMENTS EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS.

Districts	Number of employees.	Per cent of laborers earning each classified amount per hour.								
		Under 10 cents.	10 and under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.
New England	809	.....	.....	4.08	58.71	34.98	2.22	.....	.....	.....
Eastern	5,620	0.28	2.15	39.36	53.72	3.77	.28	0.43	.....	.....
Pittsburgh	18,924	.....	.16	8.33	14.35	74.87	1.18	1.05	0.05	0.01
Great Lakes and Middle West	11,067	.....	.01	.20	21.53	76.46	1.53	.27	.....	.....
Southern	2,980	1.81	14.93	49.16	30.91	3.15	.03	.....	.....	.....
Pacific Coast	68	.....	.....	.....	.....	.....	.....	86.76	13.24	.....
Total	39,468	.18	1.51	13.45	24.11	58.83	1.08	.79	.05	(1)

[1] Less than one-hundredth of 1 per cent.

Less than 2 per cent of all the common laborers in the industry received less than 12 cents, and less than 2 per cent received 18 cents and over per hour. Of all the laborers, 96.39 per cent earned 12 and under 18 cents per hour. Of all the laborers, five-sixths, or 82.94 per cent, earned 14 and under 18 cents per hour. In the New England and Eastern districts the largest single groups earned 14 and under 16 cents per hour; in the Pittsburgh and the Great Lakes and Middle West districts the largest groups, including approximately three-fourths of all the laborers, earned 16 and under 18 cents per hour, and in the Southern district the largest group earned 12 and under 14 cents per hour, although there was also a very large group earning 14 and under 16 cents per hour. All of the laborers in the Pacific Coast district earned 20 cents and over per hour. With regard to the laborers reported as earning more than 20 cents per hour in the other districts, it may be said that in each case they were working unusually short hours at very heavy work, and that their daily earnings on account of the short hours were very little above the daily earnings of employees working longer hours at a lower hourly rate of wages. The laborers reported as earning less than 12 cents per hour in every district except the Southern were, for the most part, below the average of efficiency either because of youth and inexperience or because of old age and physical disability.

Everywhere except in the South practically all included within this class of unskilled workmen are recent immigrants, the greater number of whom do not speak or understand English. Even in the

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South there is a rapidly increasing number of immigrants in the industry. Of the employees in all occupations nearly 60 per cent are foreign born and nearly two-thirds of the foreign born are of the Slavic races.

Great as is the proportion of unskilled labor in the iron and steel industry, steel experts have noted the fact that the tendency of recent years has been constantly toward the reduction of the number of highly skilled men employed and the establishment of the general wage on the basis of common, unskilled labor.[1] Each year sees a larger use of mechanical appliances which unskilled labor is usually competent to control.

HOURS OF LABOR, BY DEPARTMENTS.

Approximately two-fifths, 42.58 per cent, of the 172,671 employees for whom working time was reported worked 72 hours and over per week, which is, in effect, at least 12 hours per day, and approximately one-fifth, 20.59 per cent, worked 84 hours and over per week, which is, in effect, 12 hours per day for every day of the week. Only 37.02 per cent of all employees had a week as short as 60 hours, although in most industries 60 hours has come to be regarded as the maximum working week.

The summary which follows shows by means of cumulative percentages the classified customary hours per week for each of the departments. The average hours per week were calculated for the employees in productive occupations only, on account of the large amount of work involved.

[1] Compare the statement made by Mr. J. Stephen Jeans, secretary of the British Iron Trade Association, after a very thorough study in 1902 of American steel plants: "The tendency in the American steel industry is to reduce by every possible means the number of highly skilled men employed and more and more to establish the general wage on the basis of common unskilled labor. This is not a new thing, but it becomes every year more accentuated as a result of the use of automatic appliances which unskilled labor is usually competent to control." (American Industrial Conditions and Competition. Edited by J. Stephen Jeans, p. 217.)

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PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF HOURS PER WEEK, BY DEPARTMENTS.

Departments.	Normal number of employees.	Average customary hours per week.	Per cent of employees whose customary working time per week was—		
			Over 60 hours.	72 hours and over.	84 hours and over.
Employees in productive occupations:					
Blast furnaces	[1] 24,689	78.9	92.13	72.76	67.11
Bessemer converters	4,927	69.5	80.68	62.90	17.15
Open-hearth furnaces	12,421	74.5	92.38	75.48	20.67
Puddling mills	6,447	55.2	23.03	1.09	.06
Crucible furnaces	633	64.3	65.40	21.17	.95
Blooming mills	4,485	69.6	81.58	68.31	11.55
Plate mills	5,193	66.0	78.30	30.93	4.37
Standard rail mills	3,584	72.5	89.76	76.95	17.41
Structural, light rail, and other shape mills	3,160	70.0	78.58	66.36	15.57
Miscellaneous mechanical mills	2,869	70.2	91.60	57.62	7.18
Bar mills	[2] 16,146	61.1	45.59	14.94	1.08
Garrett rod mills	1,915	66.1	83.34	35.20	3.50
Miscellaneous rod mills	864	65.8	83.33	18.29	1.62
Tube mills	4,095	62.0	33.16	2.12	.39
Total, productive occupations	[3] 91,428	69.8	73.48	49.38	24.41
Employees in general occupations:					
Blast furnaces	6,632	.....	78.71	52.86	46.70
Bessemer converters	691	.....	92.76	84.95	24.75
Open-hearth furnaces	2,197	.....	89.39	80.88	40.51
Puddling mills	314	.....	34.39	14.97	4.46
Crucible furnaces	95	.....	57.89	38.95	26.32
Blooming mills	1,269	.....	92.36	80.54	38.46
Plate mills	748	.....	83.69	60.03	20.19
Standard rail mills	942	.....	94.80	85.24	29.19
Structural, light rail, and other shape mills	332	.....	71.69	67.17	30.42
Miscellaneous mechanical mills	403	.....	87.10	72.46	28.29
Bar mills	1,178	.....	49.83	25.72	8.23
Garrett rod mills	541	.....	74.86	43.25	13.12
Miscellaneous rod mills	.....	.....	.....	.....	.....
Tube mills	157	.....	59.87	45.22	31.85
Total, general occupations	15,499	.....	79.71	60.33	35.77
Power, mechanical, and yard force:					
Steam, gas, and water	6,037	.....	91.29	79.39	52.34
Yard and transportation	22,855	.....	43.45	27.66	8.78
Electric power and repairs	3,221	.....	50.61	32.44	18.19
Shops	22,588	.....	22.71	9.29	1.58
Mechanical repairs	3,864	.....	54.04	27.33	11.23
Shipping	4,618	.....	57.49	38.41	.54
Miscellaneous	2,561	.....	88.75	75.71	43.81
Total, power, mechanical, and yard force	65,744	.....	44.44	28.94	11.70
Grand total	[3] 172,671	.....	62.98	42.58	20.59

[1] Not including 33 employees who worked irregular hours.
[2] Not including 2 employees who worked irregular hours.
[3] Not including 35 employees who worked irregular hours.

For the employees in productive occupations the customary hours per week were longest in the blast-furnace department and shortest in the puddling-mill department. In the blast furnaces the average customary working time per week for the 24,689 employees was 78.9 hours; 67.11 per cent of the total number of employees customarily worked at least 84 hours per week, which is, in effect, 12 hours per day for 7 days per week; and more than nine-tenths, 92.13 per cent, customarily worked more than 60 hours per week. It is worthy of note, however, that in the open-hearth and the standard rail departments a larger proportion of employees than even in the blast furnaces were working 72 hours and over per week.

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In the puddling mills, with the shortest hours per week of any department, the average customary working time per week for the 6,447 employees was 55.2 hours; approximately one-fourth, 23.03 per cent, of the total number of employees customarily worked more than 60 hours per week. In the bar mills, in which there were 16,146 employees, the average customary working time per week was 61.1 hours; 45.59 per cent worked over 60 hours and 14.94 per cent worked 72 hours and over. The hours in this department are much shorter than in any of the other rolling mills. Both the puddling mills and the bar mills are and for many years have been to a large extent organized; the tube mills, on the other hand, which show almost equally short hours, have never been organized.

In each of 7 of the 14 departments more than one-half of the employees customarily worked 72 hours and over per week. Eighty-four hours and over per week was the customary working time for 67.11 per cent of the employees in the blast furnaces and for from 20.67 per cent to 11.55 per cent of all employees in each of five other departments.

In the general occupations the large proportions shown as working 84 hours and over in most of the departments are firemen, and gas-producer men, and in large part machinists and other repair men who make repairs while the mills are shut down. It may be noted that in the puddling mills and bar mills, for which the shortest hours in the productive occupations were reported, there are also very small proportions in the general occupations working the longer hours. This is due in part to the fact that these departments ordinarily have no gas producers attached, but much more to the fact that these departments are ordinarily not operated on Saturday night, so that the repair men can get their work done without working on Sunday.

In the power, mechanical, and yard force, the departments fall into three groups as regards working time. First, the steam, gas, and water and the miscellaneous departments showing the longest hours. The reason for the long hours in the first of these two is obvious, as it includes the firemen and others, one shift of whom must be on duty continuously. In the miscellaneous department are included the watchmen, which sufficiently explains the long hours in that department. The second group contains the two repair departments, many of the employees in which must work when the rest of the mill is shut down. It also contains the yard and transportation and shipping departments, which are chiefly concerned with handling the materials and products for the producing departments, and whose hours are therefore very largely dependent on the way in which the producing departments are operated. The hours for this group as a whole are much shorter than for the first

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group. The third group contains only the shops which are operated practically independently of the producing departments, and in which the hours are shorter than anywhere else in the industry. It is worthy of note, however, that in the shops, where practically any schedule of hours can be put into effect, more than one-fifth, 22.71 per cent, of all the employees work over 60 hours. In most commercial machine shops, 60 hours is regarded as the maximum week, and the union scale for machinists provides for a working week of less than 55 hours in the majority of cities in the United States. In all but 3 of 28 cities for which data are available the working hours of union machinists were 55 hours or less.

The tables which follow show in detail for each of the departments the number and per cent of employees customarily working each classified number of hours per week. The first section of the table shows numbers and the second section percentages.

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AVERAGE CUSTOMARY WORKING HOURS PER WEEK AND NUMBER AND PER CENT PER WEEK BY

Marginal number.	Departments.	Number of plants.	Normal number of employees.	Average customary working hours per week.
	Employees in productive occupations:			
1	Blast furnaces	156	24,689	78.9
2	Bessemer converters	24	4,927	69.5
3	Open-hearth furnaces	80	12,421	74.5
4	Puddling mills	47	6,447	55.2
5	Crucible furnaces	11	633	64.3
6	Blooming mills	51	4,485	69.6
7	Plate mills	34	5,193	66.0
8	Standard rail mills	10	3,584	72.5
9	Structural, light rail, and other shape mills	16	3,160	70.0
10	Miscellaneous mechanical mills	27	2,869	70.2
11	Bar mills	115	16,146	61.1
12	Garrett rod mills	19	1,915	66.1
13	Miscellaneous rod mills	11	864	65.8
14	Tube mills	12	4,095	62.0
	Total productive occupations	.....	[1] 91,428	69.8
	Employees in general occupations:			
15	Blast furnaces	153	6,632	.....
16	Bessemer converters	24	691	.....
17	Open-hearth furnaces	67	2,197	.....
18	Puddling mills	34	314	.....
19	Crucible furnaces	11	95	.....
20	Blooming mills	48	1,289	.....
21	Plate mills	31	748	.....
22	Standard rail mills	10	942	.....
23	Structural, light rail, and other shape mills	13	332	.....
24	Miscellaneous mechanical mills	28	403	.....
25	Bar mills	76	1,178	.....
26	Garrett rod mills	19	541	.....
27	Miscellaneous rod mills	.....	.....	.....
28	Tube mills	11	157	.....
	Total genera. occupations	.....	15,499	.....
	Power, mechanical, and yard force:			
29	Steam, gas, and water	.....	6,037	.....
30	Yard and transportation	.....	22,855	.....
31	Electric power and repairs	.....	3,221	.....
32	Shops	.....	22,588	.....
33	Mechanical repairs	.....	3,864	.....
34	Shipping	.....	4,618	.....
35	Miscellaneous	.....	2,561	.....
	Total power, mechanical, and yard force	.....	65,744	.....
	Grand total	.....	[2] 172,671	.....

[1] Not including 31 employees who worked 2 days only and 2 employees who worked 3 days only.
[2] Not including 2 employees who worked 1 day only.

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OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS DEPARTMENTS.

Number of employees whose customary working hours per week were—									Marginal number.
48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.	
10	29	209	1,694	4,784	308	1,086	16,545	24	1
611	149	98	94	876	1,828	426	790	55	2
14	51	136	745	2,100	3,241	3,567	2,540	27	3
1,143	2,868	108	843	1,415	58	8	4	.....	4
.....	94	23	102	280	113	15	6	.....	5
474	7	66	279	595	2,262	284	505	13	6
424	196	113	394	2,460	1,281	98	226	1	7
182	.....	15	170	459	2,122	12	624	.....	8
100	8	248	321	386	1,543	62	492	.....	9
105	2	3	131	975	1,252	195	206	.....	10
1,737	2,266	2,286	2,496	4,948	2,105	141	151	16	11
117	101	78	23	922	599	8	67	.....	12
.....	2	54	88	562	137	7	12	2	13
.....	.....	245	2,492	1,271	53	18	6	10	14
4,917	5,773	3,682	9,872	22,033	16,902	5,927	22,174	148	
22	28	111	1,251	1,714	137	272	3,062	15	15
3	.....	21	26	54	333	83	169	2	16
2	5	96	120	187	433	454	884	6	17
7	40	6	153	61	19	14	14	.....	18
.....	22	3	15	18	3	9	25	.....	19
.....	21	16	60	150	437	97	485	3	20
.....	4	27	91	177	228	70	151	.....	21
.....	.....	.....	49	90	512	16	275	.....	22
3	3	20	68	15	119	3	101	.....	23
.....	2	1	49	59	102	76	111	3	24
.....	134	196	261	284	162	44	94	3	25
.....	20	16	100	171	153	10	71	.....	26
.....	.....	.....	.....	.....	.....	.....	.....	.....	27
.....	.....	14	49	23	13	8	50	.....	28
37	279	527	2,302	3,003	2,651	1,156	5,512	32	
3	21	57	445	718	925	708	3,145	15	29
52	723	2,763	9,386	3,610	3,436	878	1,973	34	30
3	39	245	1,304	585	276	183	554	32	31
138	1,256	2,989	13,076	3,030	1,004	737	243	115	32
3	102	339	1,332	1,032	295	327	414	20	33
.....	146	613	1,204	881	1,462	287	25	.....	34
20	33	83	152	334	596	221	1,082	40	35
219	2,320	7,069	26,899	10,190	7,994	3,341	7,436	256	
5,173	8,372	11,298	39,073	35,226	27,547	10,424	35,122	436	

Not including 2 employees who worked 1 day only; 31 employees who worked 2 days only and 3 employees who worked 3 days only.

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AVERAGE CUSTOMARY WORKING HOURS PER WEEK AND NUMBER AND PER CENT PER WEEK, BY

Marginal number.	Departments.	Number of plants.	Normal number of employees.	Average customary working hours per week.
	Employees in productive occupations:			
1	Blast furnaces	156	24,689	78.9
2	Bessemer converters	24	4,927	69.5
3	Open-hearth furnaces	80	12,421	74.5
4	Puddling mills	47	6,447	55.2
5	Crucible furnaces	11	633	64.3
6	Blooming mills	51	4,485	69.6
7	Plate mills	34	5,193	66.0
8	Standard rail mills	10	3,584	72.5
9	Structural, light rail, and other shape mills	16	3,160	70.0
10	Miscellaneous mechanical mills	27	2,869	70.2
11	Bar mills	115	16,146	61.1
12	Garrett rod mills	19	1,915	66.1
13	Miscellaneous rod mills	11	864	65.8
14	Tube mills	12	4,095	62.0
	Total, productive occupations	.....	[1] 91,428	69.8
	Employees in general occupations:			
15	Blast furnaces	153	6,632	.....
16	Bessemer converters	24	691	.....
17	Open-hearth furnaces	67	2,197	.....
18	Puddling mills	34	314	.....
19	Crucible furnaces	11	95	.....
20	Blooming mills	48	1,269	.....
21	Plate mills	31	748	.....
22	Standard rail mills	10	942	.....
23	Structural, light rail, and other shape mills	13	332	.....
24	Miscellaneous mechanical mills	23	.....	.....
25	Bar mills	76	1,178	.....
26	Garrett rod mills	19	541	.....
27	Miscellaneous rod mills	.....	.....	.....
28	Tube mills	11	157	.....
	Total, general occupations	.....	15,499	.....
	Power, mechanical, and yard force:			
29	Steam, gas, and water	.....	6,037	.....
30	Yard and transportation	.....	22,855	.....
31	Electric power and repairs	.....	3,221	.....
32	Shops	.....	22,588	.....
33	Mechanical repairs	.....	3,864	.....
34	Shipping	.....	4,618	.....
35	Miscellaneous	.....	2,561	.....
	Total, power, mechanical, and yard force	.....	65,744	.....
	Grand total	.....	[2] 172,671	.....

[1] Not including 31 employees who worked 2 days only and 2 employees who worked 3 days only.
[2] Not including 2 employees who worked 1 day only.

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OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS DEPARTMENTS—Concluded.

Per cent of employees whose customary working hours per week were—									Marginal number
48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.	
0.04	0.12	0.85	6.86	19.38	1.25	4.40	67.01	0.10	1
12.40	3.02	1.99	1.91	17.78	37.10	8.65	16.03	1.12	2
.11	.41	1.09	6.00	16.91	26.09	28.72	20.45	.22	3
17.73	44.49	1.68	13.08	21.95	.90	.12	.06	.....	4
.....	14.85	3.63	16.11	44.23	17.85	2.37	.95	.....	5
10.57	.16	1.47	6.22	13.27	50.43	6.33	11.26	.29	6
8.16	3.77	2.18	7.50	47.37	24.67	1.89	4.35	.02	7
5.08	.....	.42	4.74	12.81	59.21	.33	17.41	.....	8
3.16	.25	7.85	10.16	12.22	48.83	1.96	15.57	.....	9
3.66	.07	.10	4.57	33.98	43.64	6.80	7.18	.....	10
10.76	14.03	14.16	15.46	30.65	13.04	.87	.94	.10	11
6.11	5.27	4.07	1.20	48.15	31.28	.42	3.50	.....	12
.....	.23	6.25	10.19	65.05	15.86	.81	1.39	.23	13
.....	.....	5.98	60.85	31.04	1.29	.44	.15	.24	14
5.38	6.31	4.03	10.80	24.10	18.49	6.48	24.25	.16	
.33	.42	1.67	18.86	25.84	2.07	4.10	46.47	.23	15
.43	.....	3.04	3.76	7.81	48.19	12.01	24.46	.29	16
.09	.23	4.37	5.92	8.51	19.71	20.66	40.24	.27	17
2.23	12.74	1.91	48.73	19.43	6.05	4.46	4.46	.....	18
.....	23.16	3.16	15.79	18.95	3.16	9.47	26.32	.....	19
.....	1.65	1.26	4.73	11.82	34.44	7.64	38.22	.24	20
.....	.53	3.61	12.17	23.66	30.48	9.36	20.19	.....	21
.....	.....	.....	5.20	9.55	54.35	1.70	29.19	.....	22
.90	.90	6.02	20.48	4.52	35.84	.90	30.42	.....	23
.....	.50	.25	12.16	14.64	25.31	18.86	27.54	.74	24
.....	11.38	16.64	22.16	24.11	13.75	3.74	7.98	.25	25
.....	3.70	2.96	18.48	31.61	28.28	1.85	13.12	.....	26
.....	.....	.....	.....	.....	.....	.....	.....	.....	27
.....	.....	8.92	31.21	14.65	8.28	5.10	31.85	.....	28
.24	1.80	3.40	14.85	19.38	17.10	7.46	35.56	.21	
.05	.35	.94	7.37	11.89	15.32	11.73	52.10	.25	29
.23	3.16	12.09	41.07	15.80	15.03	3.84	8.63	.15	30
.09	1.21	7.61	40.48	18.16	8.57	5.68	17.20	.99	31
.61	5.56	13.23	57.89	13.41	4.44	3.26	1.08	.51	32
.08	2.64	8.77	34.47	26.71	7.63	8.46	10.71	.52	33
.....	3.16	13.27	26.07	19.08	31.66	6.21	.54	.....	34
.78	1.29	3.24	5.94	13.04	23.27	8.63	42.25	1.56	35
.33	3.53	10.78	40.91	15.50	12.16	5.08	11.31	.39	
3.00	4.85	6.54	22.63	20.40	15.95	6.04	20.34	.25	

[1]Not including 2 employees who worked 1 day only, 31 employees who worked 2 days only, and 2 employees who worked 3 days only.

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In every department the customary working time for some employees was 84 hours and over per week, and in 11 of the 14 departments the customary working time for at least a few employees was 48 hours and under per week. There were 4 departments in which more than 10 per cent of the employees customarily worked 48 hours or less per week. The employees working these shorter hours are almost all in the more skilled occupations and in positions requiring great physical strain or exposure to great heat.

As regards the particular group of hours in productive occupations at which the largest proportion of employees in each of the departments were reported as customarily working, blast furnaces alone show the predominating group as customarily working 84 hours. In the Bessemer converters, in common with the blooming, standard rail, structural, and miscellaneous mechanical mills, the largest proportion of employees were reported as working 72 hours per week. In the crucible furnace department and in the plate, bar, Garrett rod, and miscellaneous rod mills the customary working time of the predominant group was over 60 and under 72 hours per week, although in the bar mills very large groups were reported as working each classified number of hours under 72 hours per week. In the open-hearth department groups of almost equal size were reported as working 72, over 72 and under 84, and 84 hours per week, respectively. In the puddling mills the predominant group worked over 48 and under 56 hours per week, and in the tube mills 60 hours per week.

In the general occupations, it may be briefly noted that the largest single group in practically all of the departments customarily work either 84 or 72 hours per week. In 6 departments the largest group works 84 hours; in 4 departments the largest group works 72 hours. In the power, mechanical, and yard force the largest single group in each of 4 departments works 60 hours, in each of 2 departments, 84 hours, and in 1 department 72 hours. In the two largest departments of this force, the yard and shops, the group working 60 hours per week is much larger than any other.

In order to bring out more clearly the general situation as regards customary working time in the industry, the following table, drawn up in much simpler form than the preceding, has been prepared. In this table the productive and general occupations have been combined for each of the departments.

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PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY BRANCH OF INDUSTRY.

Branches of industry.	Number of plants.	Normal number of employees.	Per cent of employees whose customary working hours per week were—								
			48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Blast furnaces	156	[1] 31,321	0.10	0.18	1.02	9.40	20.75	1.42	4.34	62.66	0.12
Steel works and rolling mills:											
Bessemer converters	24	5,618	10.93	2.65	2.12	2.14	16.55	38.47	9.06	17.07	1.01
Open-hearth furnaces	80	14,618	.11	.38	1.59	5.99	15.65	25.13	27.51	23.42	.23
Puddling mills and crucible furnaces	58	7,489	15.36	40.38	1.87	14.86	23.69	2.58	.61	.65	.....
Rolling mills	212	[2] 43,629	7.20	6.34	7.19	10.50	28.08	29.83	2.57	8.18	.09
Tube mills	12	4,252	.....	.....	6.09	59.76	30.43	1.55	.61	1.32	.24
Total steel works and rolling mills	212	[2] 75,606	6.51	7.93	5.14	12.21	24.52	25.27	7.57	10.66	.19
Power, mechanical and yard force	168	65,744	.33	3.53	10.78	40.91	15.50	12.16	5.08	11.31	.39
Grand total	338	[3] 172,671	3.00	4.85	6.54	22.63	20.40	15.95	6.04	20.34	.25

[1] Not including 31 employees who worked 2 days only and 2 employees who worked 3 days only.
[2] Not including 2 employees who worked 1day only.
[3] Not including 2 employees who worked 1 day only, 31 employees who worked 2 days only, and 2 employees who worked 3 days only.

The facts presented in this table are of such simple character that extended comment is unnecessary, except to point out the wide differences which exist between the customary working hours in the principal branches of the industry. Between the blast furnaces and the steel works and rolling mills there is a considerable difference, which would be much larger were it not for the long hours worked by a large number of employees in the open-hearth department. This difference, due in large measure to the fact that at the time of this investigation the larger number of blast-furnace employees in every plant in the United States were working seven days per week, has been greatly decreased by introducing into a number of plants a plan by which each employee in the department is allowed one day off each week. There is an almost equally great difference between the customary working hours of the predominating proportion of employees in the steel works and rolling mills and the power, mechanical, and yard force. This difference, it may be remarked, has not been changed.

The table which follows brings into comparison for each department the per cent of employees customarily working less than 60 hours per week and the per cent customarily working 72 hours and over per week. The proportions shown here it may be noted have not been altered in any way by the orders recently put into effect in a number of plants to eliminate 7-day work, as none of the plans proposed reduces the working week to less than 72 hours.

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PER CENT OF EMPLOYEES CUSTOMARILY WORKING LESS THAN 60 HOURS PER WEEK AND PER CENT CUSTOMARILY WORKING 72 HOURS AND OVER, BY DEPARTMENTS

Departments.	Per cent of employees whose customary working time per week was—	
	Less than 60 hours.	72 hours and over.
Employees in productive occupations:		
Blast furnaces	1.01	72.76
Bessemer converters	17.41	62.90
Open-hearth furnaces	1.61	75.48
Puddling mills	63.90	1.06
Crucible furnaces	18.48	21.17
Blooming mills	12.20	68.31
Plate mills	14.11	30.93
Standard rail mills	5.50	76.95
Structural, light rail, and other shape mills	11.26	66.36
Miscellaneous mechanical mills	3.83	57.62
Bar mills	38.95	14.94
Garrett rod mills	15.45	35.20
Miscellaneous rod mills	6.48	18.39
Tube mills	5.96	2.12
Total productive occupations	15.72	49.38
Employees in general occupations:		
Blast furnaces	2.43	52.86
Bessemer converters	3.47	84.95
Open-hearth furnaces	4.69	80.88
Puddling mills	16.88	14.97
Crucible furnaces	26.32	38.95
Blooming mills	2.92	80.54
Plate mills	4.14	60.03
Standard rail mills	.....	85.24
Structural, light rail, and other shape mills	7.83	67.17
Miscellaneous mechanical mills	.74	72.46
Bar mills	28.01	25.72
Garrett rod mills	6.65	43.25
Miscellaneous rod mills	.....	.....
Tube mills	8.92	45.22
Total, general occupations	5.44	60.33
Power, mechanical, and yard force:		
Steam, gas, and water	1.34	79.39
Yard and transportation	15.48	27.66
Electric power and repairs	8.91	32.44
Shops	19.40	9.20
Mechanical repairs	11.49	27.33
Shipping	16.44	38.41
Miscellaneous	5.31	75.71
Total, power, mechanical, and yard force	14.64	28.94
Grand total	14.39	42.58

HOURS OF LABOR, BY DEPARTMENTS AND DISTRICTS.

A summary of hours customarily worked per week by districts for the whole industry is misleading, for the reason that the hours worked in certain departments are much longer than in other and further, that the different departments are not distributed in the same proportion through the several districts.

A few tables are here presented summarizing customary working hours per week by departments and districts. In these tables the total for all districts includes all plants, but data as to customary working hours for a department are not shown for any district from which only one plant is reported. Data for the Pacific Coast district

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are entirely omitted for the reason that only a few plants are located in that district. In using these tables the reader should bear in mind that all plants from all districts are included in the column "Total, all districts."

AVERAGE CUSTOMARY WORKING HOURS PER WEEK OF EMPLOYEES IN PRODUCTIVE OCCUPATIONS IN EACH DEPARTMENT, BY DISTRICTS.

[The averages here shown are not the hours the plants were in operation, but are the average hours worked by all employees within each department, including those who worked a small number of hours and those who worked a large number of hours per week.]

Departments.	New England.	Eastern.	Pittsburgh.	Great Lakes and Middle West.	Southern.	Total, all districts.
Blast furnaces	76.9	78.4	78.7	79.4	79.4	78.9
Bessemer converters	.....	.....	68.2	73.5	66.2	69.5
Open-hearth furnaces	64.5	72.4	75.3	75.2	76.6	74.5
Puddling mills	62.1	54.9	54.7	53.1	47.9	55.2
Crucible furnaces	64.4	63.3	65.3	.....	.....	64.3
Blooming mills	63.1	69.6	68.0	72.1	73.8	69.6
Plate mills	.....	61.5	67.3	71.7	.....	66.0
Standard rail mills	.....	67.3	72.1	74.8	.....	72.5
Structural, light rail, and other shape mills	.....	62.4	70.6	73.1	.....	70.0
Miscellaneous mechanical mills	.....	.....	69.9	70.8	.....	70.2
Bar mills	58.8	59.6	62.2	61.3	57.3	61.1
Garrett rod mills	.....	60.3	67.2	66.1	.....	66.1
Miscellaneous rod mills	66.2	.....	65.7	65.6	.....	65.8
Tube mills	.....	61.7	62.3	.....	.....	62.0

In some of the departments there are practically no variations in the average customary working hours per week for districts, while in other departments the variations are marked.

In blast furnaces the average customary working hours per week were 79.4 in the Great Lakes and Middle West district and in the Southern district, 78.7 in the Pittsburgh district, 78.4 in the Eastern district, and 76.9 in the New England district. In the crucible department and in the bar mills, where the work is not necessarily continuous for 7 days per week, there are also but slight variations in district averages.

In the puddling department marked variations in district averages occur. The average customary working hours per week were 62.1 in the New England district, 54.9 in the Eastern district, 54.7 in the Pittsburgh district, 53.1 in the Great Lakes and Middle West district, and 47.9 in the Southern district.

Customary hours worked per week may be compared in five departments for the five districts shown. The average hours per week were higher in the Southern district than in the other four districts in open-hearth and blooming mills, higher in the Southern and Great Lakes and Middle West districts than in any of the other three districts in blast furnaces, higher in the New England district than in any other district in puddling mills, and higher in the Pittsburgh district than in any other district in bar mills. In the 12 depart-

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ments where the average hours in the Pittsburgh district and in the Great Lakes and Middle West district can be compared, the average hours were longer in seven departments in the Great Lakes and Middle West district than in the Pittsburgh district.

The next summary shows for each district the per cent of employees in each department customarily working 72 hours and over per week. Data for a department are not shown for any district from which only one plant reported, and data for the Pacific Coast district are entirely omitted owing to the small number of plants in that section of the country. All plants and all districts, however, are included in the column "Total, all districts."

PER CENT OF EMPLOYEES IN EACH DEPARTMENT CUSTOMARILY WORKING 72 HOURS AND OVER PER WEEK, BY DISTRICTS.

Departments.	New England.	Eastern.	Pittsburgh.	Great Lakes and Middle West.	Southern.	Total, all districts.
Employees in productive occupations:						
Blast furnaces	59.15	71.64	72.93	74.32	72.22	72.76
Bessemer converters	.....	.....	60.84	90.11	27.80	62.90
Open-hearth furnaces	4.90	52.46	81.96	85.19	94.12	75.48
Puddling mills	.33	.78	1.88	1.50	.....	1.01
Crucible furnaces	10.64	.....	43.18	.....	.....	21.17
Blooming mills	.....	45.02	65.51	86.07	71.97	68.39
Plate mills	.....	5.76	34.86	81.73	.....	30.93
Standard rail mills	.....	44.06	87.15	82.95	.....	76.95
Structural, light rail, and other shape mills	.....	4.19	79.26	77.56	.....	66.36
Miscellaneous mechanical mills	.....	.....	56.39	64.18	.....	57.62
Bar mills	1.20	10.33	18.75	16.57	.....	14.94
Garrett rod mills	.....	1.20	39.61	37.35	.....	35.20
Miscellaneous rod mills	5.88	.....	32.67	12.88	.....	18.29
Tube mills	.....	.....	2.34	.....	.....	2.12
Total, productive occupations	9.70	31.01	49.95	64.04	63.24	49.38
Employees in general occupations:						
Blast furnaces	57.63	52.29	56.47	54.95	42.47	52.86
Bessemer converters	.....	23.08	95.40	87.82	56.06	84.95
Open-hearth furnaces	51.28	68.97	86.28	85.55	89.25	80.88
Puddling mills	.....	18.99	12.68	16.67	.....	14.97
Crucible furnaces	8.00	59.38	38.71	57.14	.....	38.95
Blooming mills	65.38	57.28	77.23	94.59	72.32	80.54
Plate mills	.....	40.48	71.72	73.46	.....	60.03
Standard rail mills	.....	43.05	94.33	92.23	96.72	85.24
Structural, light rail, and other shape mills	.....	8.11	90.79	68.95	.....	67.17
Miscellaneous mechanical mills	33.33	.....	78.40	71.21	100.00	72.46
Bar mills	2.94	13.87	32.11	39.76	2.90	25.72
Garrett rod mills	.....	2.86	7.91	53.96	84.71	43.25
Miscellaneous rod mills	.....	.....	.....	.....	.....	.....
Tube mills	50.00	60.00	45.32	.....	.....	45.22
Total, general occupations	29.10	46.77	63.51	68.54	53.76	60.33
Power, mechanical, and yard force:						
Steam, gas, and water	36.48	57.28	83.87	80.53	79.17	79.39
Yard and transportation	2.80	11.44	34.00	29.77	7.61	27.66
Electric power and repairs	10.26	18.02	44.38	22.09	11.48	32.44
Shops	1.90	2.51	14.34	4.64	11.43	9.29
Mechanical repairs	2.33	16.58	33.83	20.75	7.17	27.33
Shipping	.....	8.65	43.78	36.26	.....	38.41
Miscellaneous	80.77	84.94	83.66	63.14	42.65	75.71
Total, power, mechanical, and yard force	8.11	16.13	36.46	24.62	11.65	28.94
Grand total	10.46	28.73	45.07	48.60	47.04	42.58

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In every department the districts vary materially in the proportion of employees in productive occupations customarily working 72 hours and over per week.

In the blast furnaces 72 hours and over per week was the customary working time for approximately three-fourths of all employees in all districts except in the New England, and in that district the proportion was nearly three-fifths.

In the Bessemer converting department marked variations occur. The customary working time per week was 72 hours and over for 90.11 per cent of the employees in the Great Lakes and Middle West district, 60.84 per cent in the Pittsburgh district, and only 27.80 per cent in the Southern district.

In the blooming mills the customary working time per week was 72 hours and over for 86.07 per cent of the employees in the Great Lakes and Middle West district, 71.97 per cent in the Southern district, 65.51 per cent in the Pittsburgh district, 45.02 per cent in the Eastern district, and for none of the employees in the New England district.

As appears from the preceding table, comparisons for four districts can be made in five departments. The Pittsburgh district shows a larger per cent customarily working 72 hours and over per week than does any other district in puddling and in bar mills, the Great Lakes and Middle West district in blast furnaces and in blooming mills, and the Southern district in open-hearth furnaces. The New England district shows a smaller per cent customarily working 72 hours and over than does any other district in four of the five departments.

A comparison of the Pittsburgh district and the Great Lakes and Middle West district can be made in 12 departments. In 6 of those 12 departments the Great Lakes and Middle West district shows a larger per cent of employees customarily working 72 hours and over per week than does the Pittsburgh district.

As regards the power, mechanical, and yard force the principal facts to be noted are the wide variations that exist between the different districts, where uniformity might be expected; and second, the fact that in every department except the miscellaneous the Pittsburgh district shows a larger proportion of employees working 72 hours and over.

The next summary shows for each district the per cent of employees in each department customarily working 60 hours and less per week. Data for a department are not shown for any district from which only one plant reported, and data for the Pacific Coast district are entirely omitted owing to the small number of plants in that section of the country. All plants and all districts, however, are included in the column "Total, all districts."

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PER CENT OF EMPLOYEES IN EACH DEPARTMENT CUSTOMARILY WORKING 60 HOURS AND LESS PER WEEK, BY DISTRICTS.

Departments.	New England.	Eastern.	Pittsburgh.	Great Lakes and Middle West.	Southern	Total, all districts.
Employees in productive occupations:						
Blast furnaces	6.10	11.27	9.00	6.07	4.74	7.87
Bessemer converters	.....	.....	27.36	7.31	29.34	19.32
Open-hearth furnaces	46.57	12.76	3.25	9.43	5.46	7.62
Puddling mills	30.71	89.33	65.26	84.67	100.00	76.97
Crucible furnaces	39.72	18.97	38.38	.....	.....	34.60
Blooming mills	45.16	11.62	24.10	12.02	.84	18.42
Plate mills	.....	35.00	19.08	2.24	.....	21.70
Standard rail mills	.....	5.07	9.08	14.26	.....	10.24
Structural, light rail, and other shape mills	.....	50.74	11.01	21.34	.....	21.42
Miscellaneous mechanical mills	.....	.....	6.49	10.40	.....	8.40
Bar mills	90.09	70.89	41.80	55.99	75.68	54.41
Garrett rod mills	.....	56.80	8.61	13.57	.....	16.67
Miscellaneous rod mills	6.54	.....	24.09	15.46	5.00	16.67
Tube mills	.....	51.43	63.28	.....	.....	66.84
Total, productive occupations	48.00	40.26	24.40	19.73	15.00	26.52
Employees in general occupations:						
Blast furnaces	25.42	34.35	24.16	12.06	21.28	21.29
Bessemer converters	.....	.....	1.72	10.08	30.30	7.24
Open-hearth furnaces	12.82	17.41	6.86	11.06	.....	10.61
Puddling mills	97.50	60.34	63.38	58.33	.....	65.61
Crucible furnaces	40.00	37.50	58.06	.....	.....	42.11
Blooming mills	.....	17.37	9.16	4.29	1.79	7.64
Plate mills	.....	25.26	5.39	20.37	.....	16.31
Standard rail mills	.....	.....	4.96	7.20	3.28	5.20
Structural, light rail, and other shape mills	.....	62.16	5.26	30.59	.....	28.31
Miscellaneous mechanical mills	.....	100.00	7.20	14.02	.....	12.90
Bar mills	92.65	56.77	43.16	33.53	91.30	50.17
Garrett rod mills	.....	48.57	26.62	24.82	15.29	25.14
Miscellaneous rod mills	.....	.....	.....	.....	.....	.....
Tube mills	50.00	40.00	39.57	50.00	.....	40.13
Total, general occupations	50.00	31.10	19.51	13.92	19.36	20.29
Power, mechanical, and yard force:						
Steam, gas, and water	26.42	14.56	7.16	7.91	19.79	8.71
Yard and transportation	89.87	76.89	49.30	49.73	92.27	56.55
Electric power and repairs	82.05	75.68	34.11	58.85	87.70	49.39
Shops	96.77	87.16	74.21	76.05	82.04	77.29
Mechanical repairs	76.74	79.02	32.34	56.74	85.65	45.96
Shipping	100.00	62.08	38.85	42.49	49.18	42.51
Miscellaneous	15.38	5.18	11.09	11.04	52.94	11.25
Total, power, mechanical, and yard force	83.32	71.15	48.22	55.79	84.48	55.56
Grand total	59.52	47.42	34.21	33.66	35.51	37.02

In every department the districts show marked variations in the proportion of employees in productive occupations customarily working 60 hours and less per week.

In the open-hearth department the customary working time per week was 60 hours and less for 3.25 per cent of the employees in the Pittsburgh district, 5.46 per cent in the Southern district, 9.43 per cent in the Great Lakes and Middle West district, 12.76 per cent in the Eastern district, and 46.57 per cent in the New England district.

Comparisons for the five districts can be made in five departments. The Pittsburgh district shows a smaller per cent than any other district customarily working 60 hours and less in open-hearth and bar mills, the Southern district a smaller per cent than any other in

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blast furnaces and blooming mills, and the New England district a smaller per cent than any other district in puddling mills. The New England district shows a larger per cent than any other district customarily working 60 hours and less in open-hearth, blooming, and bar mills.

A comparison of the Pittsburgh district and the Great Lakes and Middle West district can be made in 12 of the producing departments. In 7 of those 12 departments the Pittsburgh district had a smaller per cent of employees customarily working 60 hours and less per week than did the Great Lakes and Middle West district.

In order to show clearly the conditions existing in May, 1910, as regards the per cent of employees in each district and department who were working at least 84 hours per week, which is the equivalent of 12 hours per day 7 days per week, the following table has been prepared. Data for a department are not shown for any district from which only one plant reported, and data for the Pacific Coast district are entirely omitted, owing to the small number of plants in that section of the country. All plants and all districts, however are included in the column "Total, all districts."

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PER CENT OF EMPLOYEES IN EACH DEPARTMENT CUSTOMARILY WORKING 84 HOURS AND OVER PER WEEK BY DISTRICTS.

Departments.	New England.	Eastern.	Pittsburgh.	Great Lakes and Middle West.	Southern.	Total, all districts.
Employees in productive occupations:						
Blast furnaces	57.93	64.53	64.54	71.21	70.07	67.11
Bessemer converters	.....	11.75	15.34	25.73	.....	17.15
Open-hearth furnaces	.98	20.66	14.99	31.03	3.59	20.67
Puddling mills	.....	.06	.....	.37	.....	.06
Crucible furnaces	.....	.....	1.48	7.69	.....	.95
Blooming mills	.....	4.36	7.34	20.70	21.76	11.55
Plate mills	.....	.76	6.76	3.21	.....	4.37
Standard rail mills	.....	1.07	16.90	27.05	.....	17.41
Structural, light rail, and other shape mills	.....	.63	10.64	31.46	.....	15.57
Miscellaneous mechanical mills	.....	.....	4.41	11.58	.....	7.18
Bar mills	.....	.58	1.37	1.11	.....	1.03
Garrett rod mills	.....	.....	1.48	4.29	23.81	3.50
Miscellaneous rod mills	4.58	.....	.....	1.80	.....	1.62
Tube mills	.....	.....	.35	1.01	.....	.39
Total, productive occupations	7.94	19.12	19.81	32.24	49.27	24.41
Employees in general occupations:						
Blast furnaces	55.93	45.06	47.35	49.62	41.13	46.70
Bessemer converters	.....	23.08	28.45	25.63	3.03	24.75
Open-hearth furnaces	12.82	48.28	16.50	53.83	60.75	40.51
Puddling mills	.....	3.91	4.23	16.67	.....	4.46
Crucible furnaces	8.00	31.25	35.48	28.57	.....	26.32
Blooming mills	15.38	45.54	31.94	40.30	43.75	38.46
Plate mills	.....	12.46	26.26	22.84	.....	20.19
Standard rail mills	.....	20.53	53.19	32.01	.....	29.19
Structural, light rail, and other shape mills	.....	8.11	2.63	43.84	.....	30.42
Miscellaneous mechanical mills	.....	.....	32.00	28.03	.....	28.29
Bar mills	2.94	5.16	10.26	11.28	2.90	8.23
Garrett rod mills	.....	.....	.....	7.91	57.65	13.12
Miscellaneous rod mills	.....	.....	.....	.....	.....	.....
Tube mills	.....	.....	35.97	.....	.....	31.85
Total, general occupations	17.16	32.69	33.60	39.60	38.39	35.77
Power, mechanical, and yard force:						
Steam, gas, and water	13.21	34.03	52.20	62.07	72.92	52.34
Yard and transportation	.43	2.02	11.19	8.37	6.56	8.78
Electric power and repairs	5.13	6.61	22.86	16.32	8.20	18.19
Shops	.57	1.09	1.94	1.54	.17	1.58
Mechanical repairs	2.33	9.07	14.12	6.80	3.14	11.23
Shipping	.....	.....	.17	4.39	.....	.54
Miscellaneous	80.77	23.76	60.79	30.03	42.65	43.81
Total, power, mechanical, and yard force	3.79	5.69	14.02	11.22	6.69	11.70
Grand total	7.21	16.99	18.20	24.59	35.42	20.59

The point of chief importance to be noted in connection with this table is the fact that in each department the districts vary materially in the percentage of employees customarily working 84 hours and over per week. In other words, very great differences as regards the amount of 7-day work done existed in different plants. In one very large plant, for example, practically all the employees connected with the blast furnaces, open-hearth furnaces, Bessemer converters, and blooming mills, together with a very large number in the other rolling mills were working 7 days per week, 12 hours per day. Owing to the great economies secured when each department takes its material immediately from the next preceding process, so that there is the least possible loss of heat, it is almost inevitable that if either the Bessemer or the open-hearth department is operated 7 days a week

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the blooming mill at least will also be operated. This creates a condition which it is extremely difficult to correct, owing to the very large number of men whom it is necessary to change suddenly from one schedule of working hours to another. Of comparative conditions as to working hours in the different districts shown in this and the preceding tables, it may be said, in general, that conditions prevailing in the different plants in each district are by no means uniform, and that this is a matter of the attitude of particular companies and officials rather than of the geographical locality. For example, while in several departments the Great Lakes and Middle West district had the largest proportion of employees working 84 hours and over, this was by no means true of all of the establishments in that district, some of which had unusually good conditions in this respect.

DAYS WORKED PER WEEK, BY DEPARTMENTS.

The customary working days or turns[1] were 7 per week for 29.28 per cent of the 172,671 employees for whom this item was reported. The customary working days or turns were 6 per week for 52.73 per cent of the total; 6 and 7 days or turns alternately for 3.70 per cent of the total; 5 and 6 days or turns alternately for 12.67 per cent of the total; and 5 days or turns for 1.62 per cent of the total.

The table which follows shows for each department the number and per cent of employees customarily working each specified number of days or turns per week.

[1] In occupations requiring continuous work day and night the period that each employee or group of employees works is known as a "turn," and the general force with which he happens to work is known as the day or night "shift." As the entire 24 hours must be covered by the men on the different shifts, the "turn" must average either 12 or 8 hours. In the case of 12-hour men the time is frequently divided so that the day turn is of 10 or 11 hours and the night turn of 14 or 13 hours respectively. It should be noted that the proportion working 7 days per week has been somewhat altered since the data here presented were collected, as has been described above.

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NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH

Marginal number.	Departments.	Number of plants.	Normal number of employees.
	Employees in productive occupations:		
1	Blast furnaces	156	[1] 24,689
2	Bessemer converters	24	4,927
3	Open-hearth furnaces	80	12,421
4	Puddling mills	47	6,447
5	Crucible furnaces	11	633
6	Blooming mills	51	4,495
7	Plate mills	34	5,193
8	Standard rail mills	10	3,584
9	Structural, light rail, and other shape mills	16	3,160
10	Miscellaneous mechanical mills	27	2,869
11	Bar mills	115	[6] 16,146
12	Garrett rod mills	19	1,915
13	Miscellaneous rod mills	11	864
14	Tube mills	12	4,095
	Total, productive occupations		[8] 91,428
	Employees in general occupations:		
15	Blast furnaces	153	6,632
16	Bessemer converters	24	691
17	Open-hearth furnaces	67	2,197
18	Puddling mills	34	314
19	Crucible furnaces	11	95
20	Blooming mills	48	1,269
21	Plate mills	31	748
22	Standard rail mills	10	942
23	Structural, light rail, and other shape mills	13	332
24	Miscellaneous mechanical mills	23	403
25	Bar mills	76	1,178
26	Garrett rod mills	19	541
27	Miscellaneous rod mills		
28	Tube mills	11	157
	Total, general occupations		15,499
	Power, mechanical, and yard force:		
29	Steam, gas, and water		6,037
30	Yard and transportation		22,855
31	Electric power and repairs		3,221
32	Shops		22,588
33	Mechanical repairs		3,864
34	Shipping		4,618
35	Miscellaneous		2,561
	Total, power, mechanical, and yard force		65,744
	Grand total		[9] 172,671

[1] Not including 31 employees who worked 2 days and 2 employees who worked 3 days only.
[2] Including 78 employees who worked 5, 6, and 7 days in rotation.
[3] Including 20 employees who worked alternately 5 and 7 days.
[4] Including 6 employees who worked alternately 5 and 7 days.
[5] Including 4 employees who worked alternately 5 and 7 days.
[6] Not including 2 employees who worked 1 day only.
[7] Including 12 employees who worked alternately 5 and 7 days.
[8] Not including 2 employees who worked 1 day only and 31 employees who worked 2 days only and 2 employees who worked 3 days only.

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SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DEPARTMENTS.

Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—					Marginal number.
5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	
15	.....	2,126	7	22,531	0.06	.....	8.65	0.03	91.26	1
.....	396	[2] 3,238	138	1,155	.....	8.04	[3] 65.72	2.80	23.44	2
23	426	[3] 5,485	3,092	3,395	.19	3.48	[3] 44.16	24.89	27.33	3
315	4,591	1,526	8	7	4.89	71.21	23.67	.12	.11	4
1	188	423	.....	21	.16	29.70	66.82	.....	3.32	5
120	244	3,262	217	642	2.68	5.44	72.73	4.84	14.31	6
13	1,186	[4] 3,643	91	255	.25	22.84	[4] 70.25	1.75	4.91	7
.....	390	2,552	4	638	.....	10.88	71.21	.11	17.80	8
3	632	[5] 1,966	60	499	.09	20.00	[5] 62.22	1.90	15.79	9
6	483	1,990	80	310	.21	16.84	69.36	2.79	10.81	10
1,024	6,180	[7] 8,535	40	367	6.34	38.28	[7] 52.86	.25	2.27	11
89	967	791	.....	68	4.65	50.50	41.31	.....	3.55	12
32	522	295	.....	15	3.70	69.42	34.14	.....	1.74	13
9	2,691	1,361	4	30	.22	65.71	33.24	.10	.73	14
1,650	18,896	[9] 37,208	3,741	29,933	1.80	20.67	[9] 40.70	4.09	32.74	
10	.....	1,554	74	4,994	.15	.....	23.43	1.12	75.30	15
.....	30	438	26	197	.....	4.34	63.39	3.76	28.51	16
3	51	721	462	1,020	.14	2.32	32.82	18.30	46.43	17
6	68	190	11	39	1.91	21.66	60.51	3.50	12.42	18
1	3	44	8	39	1.05	3.16	46.32	8.42	41.05	19
28	25	554	66	596	2.21	1.97	43.66	5.20	46.97	20
3	57	[10] 456	69	168	.40	7.62	[10] 60.96	9.22	21.79	21
.....	69	561	15	297	.....	7.32	59.55	1.59	31.53	22
.....	91	137	2	102	.....	27.41	41.27	.60	30.72	23
.....	41	170	18	174	.....	10.17	42.18	4.47	43.18	24
53	151	[11] 790	22	162	4.50	12.82	[11] 67.06	1.87	13.75	25
14	188	258	6	75	2.59	34.75	47.69	1.11	13.86	26
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27
.....	44	55	6	52	.....	28.08	35.03	3.82	33.12	28
118	813	[7] 5,928	725	7,910	.76	5.28	[7] 38.25	4.68	51.04	
52	241	[10] 1,676	527	3,541	.86	3.99	[10] 27.76	8.73	58.65	29
310	908	[12] 17,100	786	3,751	1.36	3.97	[12] 74.82	3.44	16.41	30
13	52	2,108	115	963	.40	1.61	65.45	3.57	28.97	31
469	250	19,625	253	1,991	2.06	1.11	86.88	1.12	8.81	32
17	31	[13] 2,686	216	914	.44	.80	[13] 69.51	5.59	23.65	33
158	434	3,739	12	275	3.42	9.40	80.97	.26	5.95	34
9	250	977	16	1,309	.35	9.76	38.15	.62	51.11	35
1,028	2,166	[14] 47,911	1,925	12,714	1.56	3.29	[14] 72.88	2.93	19.34	
2,796	21,880	[15] 91,047	6,391	50,557	1.62	12.67	[15] 52.73	3.70	29.28	

[9] Including 42 employees who worked alternately 5 and 7 days and 78 employees who worked 5, 6, and 7 days in rotation.
[10] Including 7 employees who worked alternately 5 and 7 days.
[11] Including 5 employees who worked alternately 5 and 7 days.
[12] Including 24 employees who worked alternately 5 and 7 days.
[13] Including 9 employees who worked alternately 5 and 7 days.
[14] Including 40 employees who worked alternately 5 and 7 days.
[15] Including 94 employees who worked alternately 5 and 7 days and 78 employees who worked 5, 6, and 7 days in rotation.

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In spite of the fact stated on page xv that the percentage of employees working 7 days per week has been somewhat altered since the date of these reports, it is of the greatest importance that the conditions existing in the industry at the beginning of the present investigation should be clearly understood.

The blast-furnace department is the only one of the 14 departments where there is any metallurgical necessity for continuous operation day and night throughout 7 days per week. In industries other than iron and steel, where continuous operation is necessary, such for instance as street railway and newspaper publishing, it is the custom to carry a sufficient number of employees to enable each employee to rest one day in seven. Throughout the iron and steel industry prior to the present investigation and at the date of the present inquiries (May, 1910) the employees were expected to work seven days whenever the department in which they were working was running seven days and the occupation in which they were engaged required continuous work.

The above table shows that in the blast-furnace department, where the operation is continuous, 91.26 per cent of the employees in productive occupations customarily worked seven days or turns per week. The table also shows that in every single department the customary working time of some employees was seven days per week.

In practically every department it is necessary for a few men to be on duty at all hours day and night during the week, but the proportion of the total number of employees required for this seven-day duty is very small, and in not more than 3 or 4 of the departments does the proportion required approach the number who were customarily working seven days per week. The large proportion of the Bessemer converters, open-hearth furnaces, and rolling mills working seven days or turns was due to the fact that these departments were in continuous operation in some plants, although no real necessity for this condition existed, only a desire to increase the output of the plant. It is worthy of note that of the 80 open-hearth plants reported upon here, 21, or over one-fourth, were operated on Sunday during some part of the year.

Next to the blast-furnace department the open-hearth had the largest proportion of employees customarily working seven days or turns per week, the per cent being 27.33, and the Bessemer converting was third in order with 23.44 per cent.

In order to present the general situation in the simplest form the table following has been prepared, showing the proportion of employees in each of the principal branches or divisions of the industry who worked each specified number of days or turns per week.

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PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS PER WEEK, BY BRANCHES OF INDUSTRY.

Branch of industry.	Number of plants.	Normal number of employees.	Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Blast furnaces	156	[1] 31,321	0.08	.....	11.78	0.26	87.88
Steel works and rolling mills:							
Bessemer converters	24	5,618	.....	7.58	[2] 65.43	2.92	24.07
Open-hearth furnaces	80	14,618	.18	3.26	[3] 42.45	23.90	30.20
Puddling mills and crucible furnaces	58	7,489	4.31	64.76	29.15	.36	1.42
Rolling mills	212	[4] 43,629	3.17	25.73	[5] 59.51	1.58	10.00
Tube mills	12	4,252	.21	64.32	33.30	.24	1.93
Total, steel works and rolling mills	212	[4] 75,606	2.31	26.07	[6] 52.17	5.80	13.65
Power, mechanical and yard force	168	65,744	1.56	3.29	[7] 72.88	2.93	19.34
Grand total	338	[8] 172,671	1.62	12.67	[9] 52.73	3.70	29.28

[1] Not including 31 employees who worked 2 days, and 2 employees who worked 3 days only.
[2] Including 78 employees who worked 5, 6, and 7 days in rotation.
[3] Including 20 employees who worked alternately 5 and 7 days.
[4] Not including 2 employees who worked 1 day only.
[5] Including 34 employees who worked alternately 5 and 7 days.
[6] Including 54 employees who worked alternately 5 and 7 days, and 78 employees who worked 5, 6, and 7 days in rotation.
[7] Including 40 employees who worked alternately 5 and 7 days.
[8] Not including 2 employees who worked 1 day only, 31 employees who worked 2 days only, and 2 employees who worked 3 days only.
[9] Including 94 employees who worked alternately 5 and 7 days, and 78 employees who worked 5, 6, and 7 days in rotation.

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CHAPTER I.

EARNINGS, HOURS OF LABOR, AND DAYS WORKED, IN PRODUCTIVE OCCUPATIONS, BY DEPARTMENTS.

7447°—S. Doc. 110, 62-1, vol 1——5

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CHAPTER I.

EARNINGS, HOURS OF LABOR, AND DAYS WORKED IN PRODUCTIVE OCCUPATIONS, BY DEPARTMENTS.

NATURE OF DATA AND METHOD OF PRESENTATION.

The data as to wages and hours of labor presented in this report represent, almost without exception, the conditions existing in the latter part of May, 1910. It is important, however, to understand that they as fully and almost as exactly represent the conditions existing now, July, 1911, since the data were obtained after the last general increase in wages in the industry, which took place between the 1st of January and the 1st of June, 1910.

It is true that in some plants the change in rates did not take effect until June or July, but in a number of cases of this kind these increases are covered in the present report owing to the fact that the reports submitted by the companies were for periods later than May, 1910. It is true, also, that there have been some widely scattered increases during the intervening year as well as a few decreases, but the sum total of all these changes applied to so small a number of employees that they would not appreciably affect the result shown here either for the country as a whole or for any of the districts which are reported separately.

Furthermore, there have been no changes of moment either in the number of hours or days worked per week, except that very recently a number of plants have adopted experimentally some plan based on that devised by the committee of the Iron and Steel Institute for avoiding the employment of men for seven days per week. The results of these trials need not be entered into at this point, for they have been in operation only a comparatively short time and, moreover, they will be discussed at length in the volume of this report dealing with the general conditions of labor. While no general changes in the schedule of hours per day have been reported in the trade journals of the industry during the past year, it should be noted that a number of minor changes in individual establishments have come under the notice of the Bureau in the course of the investigation. These changes have, as a rule, been in the direction of a shortening of the hours of work per day. Taking all these points into consideration, however, it may be said, with entire accuracy, that the statistics presented in the pages which follow are entirely representative

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of the general conditions existing in the iron and steel industry throughout the United States at the present time.

As has been pointed out in the introductory chapter, the employees included in this report, namely, those employed in "special iron and steel occupations" represent only a part of the total number employed in the plants from which reports were received. Although this general designation is sufficiently clear for all practical purposes, some explanation is necessary in order to make clear the reason for this separation and the basis upon which it has been made. The iron and steel industry includes among its employees a large number of men only indirectly connected with the production of steel, their functions falling, mainly, under two heads, the transportation of material and the maintenance of the plant. It is obvious that it would be misleading to present the data for these employees who might as well be found in any other industry without any differentiation from the data for the employees whose general condition and welfare is directly dependent upon the iron and steel industry. At the beginning of the tabulation an attempt was made to separate the employees into two groups, one group containing only such employees as were directly necessary in the production of iron and steel, the other group including all other employees. Insurmountable difficulties were immediately encountered in carrying out this classification, arising chiefly from the fact that in the majority of the smaller establishments all the laborers and other unskilled employees were reported without classification and could not with the greatest care have been separated into these two groups. The present plan was therefore adopted of presenting the occupations in two groups, the first including those occupations which are peculiar to the steel industry or which are so closely connected with the producing departments that their separation would be an error; the second group including those employees whose duties are not peculiar to the industry or whose functions are common to several departments and therefore can not properly be charged to any single one. It should be noted, however, that the majority of laborers and other unskilled employees, who in all plants are shifted more or less from department to department, are included in "Special iron and steel occupations," since most of them would be properly so charged and the others could not be separated. Although essentially a compromise, it is believed that this plan possesses numerous advantages for the present purposes over that which was at first preferred.

A problem of considerable difficulty was also encountered in connection with the classification of the departments and of the occupations within the departments. The difficulty arose from three sources: First, in few industries is there so widely diversified a product which is capable of being made by so many different processes; to

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such an extent is this true, that each department presented here is almost an industry in itself, and presents all the difficulties in tabulation of a separate industry. Second, in few industries are there to be found plants producing precisely the same product which differ as widely in size and type of equipment, and in methods of operation. Finally, and perhaps most important, as will be apparent from the descriptions of occupations which follow, in few industries is there so complex and at the same time so confusing a terminology as in the iron and steel industry. Occupations, tools, processes, and even entire mills are sometimes known by entirely different names in two plants in the same locality; or, what is even more confusing, the same name is used even within a single department to convey two entirely different ideas, which out of their context can not be distinguished.

In view of these difficulties, the principal object kept in view in making a classification of the departments was to be sure that all the employees within each group were engaged in handling the same general class of product and by processes which were essentially of the same general character. Similarly with occupations, the attempt was made to have each group represent, as far as possible, employees on the same general class and type of work. In a few cases it was impossible to accomplish the desired end in connection with occupations, either because helpers were in many cases included with the occupation in which they assisted, or because in different plants special devices, which could not be known except through a most detailed inspection, were used, which made it possible to employ unskilled or semiskilled workmen in an occupation which in other plants was filled only by skilled employees. The former condition applies particularly to the open-hearth department, as will be evident from the following quotation from a letter received in reply to a request for information concerning the duties of casting men in the open-hearth department.

With respect to more definite information concerning the duties of the casting men in the open hearth, I wish to say that at the time we fixed the descriptions of duties of all occupations, we decided that it would be impracticable to define the duties of this class of labor at the open hearth, because we rarely find two departments where the duties of particular men were similar. For example, in one department the first casting man is a stopper setter and a steel pourer and has charge of the ladle crew. The second casting man is assistant to the first. The third casting man has charge of all of the labor around the pouring platform, etc.

At another department the first casting man is a stopper setter and foreman. The second casting man is a steel pourer. The third casting man has charge of preparation of ladles and sets the nozzles, and so on.

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At another department the first casting man is a steel pourer and foreman, second casting man is a nozzle setter, third casting man is a platform man and mold capper, etc.

At another plant the first casting man is a stopper setter; second casting man, nozzle setter; third, steel pourer; fourth, assistant nozzle setter.

In this department the situation has been cared for in the tabulation by showing separately the occupations, such as steel pourers and stopper setters, for those plants in which their duties were definite and uniform, presenting the rest of the casting crew under two general heads, ladlemen and helpers and pitmen and helpers.

The use of special devices which permit the use of unskilled instead of skilled workmen is characteristic of the rolling mills, where the installation of a simple machine may replace a number of skilled men whose occupations are traditional in the industry. As far as possible, the confusion which results from this situation has been obviated by the use of general classes, such as "roll hands" and "unclassified" into which these employees, required by local conditions, could be placed without interfering with the general scheme of tabulation adopted for the department.

The departments presented in this report fall into three main groups: First, the smelting of ores resulting in the production of pig iron; this group includes only blast furnaces which, however, produce the raw material for use in all the other departments. Second, the purification and refining of iron, resulting in the production of steel or wrought iron; this group includes the Bessemer, the open-hearth, and the crucible methods of producing steel, and the puddling process with its modifications, by which wrought iron is made. Third, the mechanical working and shaping of wrought iron and steel in the various types of rolling mills or in tube mills. The rolling mills, it may be added, fall into two main classes. First, those that have been designated as mechanical mills, in which the material is handled almost entirely by machinery, and, second, what have been designated as hand mills, in which the product is handled during the greater part of its manipulation by workmen with the aid of tongs and bars.

The blooming mills, with which the slab mills have also been included, are employed to reduce the large ingots, weighing several tons, into which the steel is cast in the open-hearth or Bessemer departments into smaller pieces which can be worked in the mills which produce the finished or semifinished product. The other rolling mills producing such finished or semifinished products are as indicated by the names employed to designate them. In the case of the bar mills there is an especially wide range of product, varying from roughly finished bars to finished material of various shapes.

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The rod mills resemble the bar mills in general type, but differ both in the size of the product and in the elaborateness of their equipment.

The plants throughout the country as a whole have been divided among six districts for the purposes of comparison. These districts were not made strictly on geographical lines, but rather corresponding to the logical distribution of the industry. The districts are based essentially on the districts used in the directory published by the American Iron and Steel Association, although a much wider grouping has been adopted in this report. The New England district, which is very small, comprises the plants in New England proper and in eastern New York. The Eastern district includes all the plants in New Jersey, eastern and central Pennsylvania, Maryland, and the District of Columbia. By far the largest number of plants in this district are located in eastern Pennsylvania, although there are a number of very important plants in central Pennsylvania. The Pittsburgh district, so called, includes not only the plants in Pittsburgh proper, but also those in western Pennsylvania, as well as those along the border line of Ohio from the Youngstown district south to Bellaire and the plants which are located in the "panhandle" of West Virginia. This district includes by far the largest number of establishments and employees, although geographically it is the smallest district. The Great Lakes and Middle West district includes a large number of plants scattered along the Great Lakes from western New York to Wisconsin, as well as the inland plants of the Mississippi Valley, north of the southern boundary of Missouri, and of the Middle West, including Colorado. Although this is a very large territory geographically, it is essentially a unit industrially, the wage rates of the entire district being based on those paid in the two producing centers, Buffalo and Chicago. The Southern district includes the establishments in Virginia, Tennessee, Georgia, Alabama, Kentucky, and the southern part of Ohio lying along the Ohio River, as well as the plants in the southern part of West Virginia. The inclusion of the Ohio plants with the Southern district may at first seem strange, but the conditions both as to wages paid and general class of labor employed resemble much more closely the conditions of the Alabama and Kentucky plants than they do those of the inland plants of Ohio located less than 50 miles away. The Pacific coast district, as its name implies, includes a very small number of plants situated in California, Washington, and Oregon.

Practically all the employees in the iron and steel industry are paid on either a time basis with the day or hour as a unit, or on a tonnage basis. There is an essential difference between these tonnage rates and the ordinary piece rates of other industries, which has a very important bearing upon the methods of tabulation used in this report. The earnings of employees paid on a true piecework basis

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are proportionate to the exertion and skill of the individual employee. In the case of tonnage rates, however, the situation is entirely different; the tonnage rate instead of being based on the production of the individual employee applies to the production either of an entire department or of a group of employees. For example, in the Bessemer department the tonnage rates for the different employees are based on the production of the entire department, the amount of which depends on the exertions of perhaps 200 employees. Similarly in the rolling mills, the tonnage rates paid the entire rolling crew are based on the production of the mill as a whole for the particular turn on which they are employed. In the case of the ordinary piece rates the individual employee, by extraordinary exertion, may greatly increase his earnings for any particular period, or similarly with any decrease in his own efficiency his earnings may fall to less than one-half of their normal amount. In the case of tonnage workers, however, where the amount of production is dependent upon the exertion of a large number of men, the variations between different periods of any considerable length are not likely to be great. The individual employee may exert himself as he will, but unless the other members of the crew are equally anxious to increase their earnings or the superintendent has given orders which permit such an increase the amount of production will not be changed in any degree. For this reason it is proper in the case of tonnage workers, when a sufficiently long period is used, to classify the average earnings of the employees in different occupations belonging to the same general crew in a way that would be absolutely wrong in the case of ordinary pieceworkers.

It should be noted in this connection that the term "tonnage workers" includes also all employees who receive a bonus or premium based on production. The effect of the bonus is to relate the earnings of the employee directly to production and to provide an even greater incentive to increased exertion than in the case of ordinary tonnage rates.

The statistical tables presented in the sections which follow cover three main points—earnings, customary working hours per week, and days worked per week. This information is presented department by department, all the tables relating to any single department, together with the necessary explanatory and descriptive matter, being brought together under a single head. In Table I, which appears in Volume II of this report, the details upon which all of the other tables are based are published separately for each establishment. In using this table, however, it is necessary to remember that the number given an establishment in one department does not necessarily indicate the same establishment in any other department; for example, plant No. 2 in the blast-furnace department may either

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not appear at all in rolling mills or may be an entirely different number. The tables which appear in the text of this chapter present summaries of these details in a variety of forms. They fall, however, into two main classes, one in which occupations are shown separately and the other in which occupations are ignored but figures are given for the separate districts. In all the tables the average for any particular class of employees is given, but this is supplemented either in the same table or in other tables by classified earnings per hour or hours per week, which permits an exact study of the situation to be made.

BLAST FURNACES.

INTRODUCTION.

The data relative to earnings and hours of work are summarized briefly in the pages immediately following and analyzed in more detail on pages 30 to 49.

SUMMARY OF EARNINGS AND HOURS AND DAYS OF WORK.

EARNINGS.

Data relative to earnings in the special iron and steel occupations were reported for 24,722 employees in 156 blast-furnace plants.

The blast-furnace department, which is distinguished by the fact that it is the fundamental part of the whole iron and steel industry and that a very large proportion of its employees work every day in the week, including Sunday, is also notable for the very low wages paid its employees. With reference to these low rates, it should be noted that the blast furnaces are operated with about two-thirds of the employees almost totally unskilled, for in addition to the large group reported as "common laborers," in the other occupations employing the largest numbers of men, such as stockers and keepers' helpers, the employees are unskilled and are given a separate name only because they perform regularly a given set of duties.

Of the 24,722 blast-furnace employees included in this report, 37.51 per cent of the total earned 16 and under 18 cents per hour. The next largest group, 16.96 per cent, earned 14 and under 16 cents per hour; 13.07 per cent earned 18 and under 20 cents, and 12.26 per cent earned 12 and under 14 cents per hour. The average earnings per hour for all employees were 17.2 cents. The average earnings were lowest in the Southern district and highest in the Pittsburgh district.

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The distribution of earnings in the separate districts is shown in the table following:

PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, AND AVERAGE HOURLY EARNINGS, BY DISTRICTS—BLAST FURNACES.

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.										
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
New England	5	328	$0.172	.....	1.52	42.68	29.57	15.24	4.57	2.44	3.96	.....	.....	.....	.....
Eastern	27	4,232	.153	1.30	28.10	47.07	14.48	3.64	3.71	1.37	.33	.....	.....	.....	.....
Pittsburgh	47	9,588	.186	.17	2.97	2.46	55.80	20.13	12.97	3.77	1.54	0.19	.....	.....	.....
Great Lakes and Middle West	34	6,290	.183	.13	.27	17.15	46.25	15.25	14.83	3.83	2.19	.06	0.03	.....	.....
Southern	43	4,284	.138	30.32	35.85	17.39	7.10	3.22	4.46	1.26	.30	.09	.....	.....	.....
Total, all districts	156	24,722	.172	5.57	12.26	16.96	37.51	13.07	10.27	2.92	1.32	.11	.01	.....	.....

A summarization of the earnings in the form of cumulative percentages which follows is of significance in showing the low earnings of blast-furnace employees. Of all employees 34.79 per cent earned less than 16 cents per hour and 72.30 per cent earned less than 18 cents per hour. The table gives figures for each district separately as well as for the total employees in all districts combined.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR BY DISTRICTS—BLAST FURNACES.

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning—					
			Under 12 cents per hour.	Under 14 cents per hour.	Under 16 cents per hour.	Under 18 cents per hour.	Under 20 cents per hour.	Under 25 cents per hour.
New England	328	$0.172	.....	1.52	44.20	73.77	89.01	93.58
Eastern	4,232	.153	1.30	29.40	76.47	90.95	94.59	98.20
Pittsburgh	9,588	.186	.17	3.14	5.60	61.40	81.53	94.50
Great Lakes and Middle West	6,290	.183	.13	.40	17.55	63.80	79.05	93.88
Southern	4,284	.138	30.32	66.17	83.56	90.66	93.88	98.34
Total, all districts	24,722	.172	5.57	17.83	34.79	72.30	85.37	95.64

Perhaps the most striking feature shown by these figures is the very great proportion of unskilled workmen indicated by the low rates of earnings. Less than 7 per cent of the employees in any of the separate districts earned as much as 25 cents per hour, while considering the country as a whole only 4.36 per cent of the 24,722 employees earned as much as 25 cents per hour.

It will be noted that there is a much more striking difference between the different districts in the lower wage groups than in the groups earning 20 cents or more per hour.

The above comparison shows that the earnings per hour were under 14 cents for 66.17 per cent of the 4,284 employees in the Southern

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district, 29.40 per cent of the 4,232 employees in the Eastern district, 3.14 per cent of the 9,588 employees in the Pittsburgh district, 1.52 per cent of the 328 employees in the New England district, and 0.40 per cent of the 6,290 employees in the Great Lakes and Middle West district.

The most decided difference between the various districts is to be found in the groups earning under 16 cents per hour. The Pittsburgh district, for example, shows 5.60 per cent earning under 16 cents per hour, while the Great Lakes and Middle West district has 17.55 per cent, the New England district 44.20 per cent, the Eastern district 76.47 per cent, and the Southern district 83.56 per cent of the total employees earning less than 16 cents per hour.

The average earnings per hour were under 18 cents for 90.95 per cent of the employees in the Eastern district, 90.66 per cent of the employees in the Southern district, 73.77 per cent of the employees in the New England district, 63.80 per cent of the employees in the Great Lakes and Middle West district, and 61.40 per cent of the employees in the Pittsburgh district.

HOURS OF LABOR.

Customary working hours per full week were reported for 24,689 employees in special occupations in 156 blast-furnace plants. For 67.11 per cent of the 24,689 employees the customary working time was 84 hours or more per week. This means at least a 12-hour day for every day in the week, including Sunday. It will be shown later, however, that a far larger proportion work 7 days per week than would be suggested by this table.

It may be noted that 93.35 per cent of these employees fall in two groups—60 and under 72 hours and 84 hours and over per week. The customary working hours for only 1 per cent of the 24,689 employees were less than 60 per week.

The following table shows the classified customary working hours per week for each district and for the total of all districts:

PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—BLAST FURNACES.

Districts.	Normal number of employees	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—			
			Under 60.	60 and under 72.	72 and under 84.	84 and over.
New England	328	76.9	4.27	36.59	1.22	57.93
Eastern	4,232	78.4	1.89	26.47	7.11	64.53
Pittsburgh	[1] 9,555	78.7	.87	26.21	8.38	64.54
Great Lakes and Middle West	6,290	79.4	.68	24.99	3.12	71.21
Southern	4,284	79.4	.65	27.12	2.15	70.07
Total, all districts	[1] 24,689	78.9	1.00	26.24	5.65	67.11

[1] Not including 31 employees who worked 2 days only and 2 employees who worked 3 days only.

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The proportion of employees whose customary working time per week was 84 hours and over is approximately the same in the Great Lakes and Middle West district and in the Southern district, the percentages being 71.21 and 70.07, respectively. The proportion is somewhat lower in the Pittsburgh district and in the Eastern district, the percentages in those two districts being 64.54 and 64.53, respectively, and considerably lower in the New England district, where the percentage is 57.93. Only 328 employees are included, however, in the New England district.

A further combination shows that the customary working time is 72 hours per week or over for 74.33 per cent of the 6,290 employees in the Great Lakes and Middle West district, for 72.92 per cent of the 9,555 employees in the Pittsburgh district, for 72.22 per cent of the 4,284 employees in the Southern district, 71.64 per cent of the 4,232 employees in the Eastern district, and for 59.15 per cent of the 328 employees in the New England district.

DAYS PER WEEK.

Seven days or turns per week was the customary working time for 22,531, or 91.26 per cent of the 24,689 employees in the special occupations in the 156 blast-furnace plants. Six days per week was the customary working time for 2,136 employees, or 8.65 per cent of the total. In the case of the 15 employees reported as working 5 days per week, this probably represents the time which they were employed at the specific occupation in which they were reported, they being employed at other work for the remainder of the week.

The proportion of employees whose customary working time per week was 7 days in each of the 5 districts was as follows:

PER CENT OF EMPLOYEES WHOSE CUSTOMARY WORKING TIME WAS 7 DAYS PER WEEK, BY DISTRICTS—BLAST FURNACES.

Districts.	Normal number of employees.	Per cent of employees whose customary working time was 7 days per week.
New England	328	96.65
Eastern	4,232	87.36
Pittsburgh	[1] 9,555	89.95
Great Lakes and Middle West	6,290	93.28
Southern	4,284	94.65

[1] Not including 31 employees who worked 2 days only and 2 employees who worked 3 days only.

In general it may be said that in May, 1910, all the employees directly connected with the operation of blast furnaces were working 7 days or turns per week, the small number working 6 days being employed in such occupations as yard laborers or stockers, whose

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services can be dispensed with on 1 day without interfering with the operation of the furnaces.

To make clear just what is meant by this 7-day work, some explanation of the nature of the blast-furnace operations and of the manner in which the working time of the employees is arranged is necessary. The blast furnaces are operated continuously day and night, every day in the week, from the time the furnace is first "blown in" or put into operation until its lining is finally worn out and it is "blown out," unless it is banked for some period because of a lack of demand for its product. "Banking," which means, briefly, maintaining a low temperature in the furnace by banking the fire with coke, is a very expensive matter and is seldom done if it can in any way be avoided. The custom has been to operate the furnaces continuously 7 days per week, using two shifts of men, one shift working during the day and the other at night. In order that each shift shall have an equal amount of day and night work, the universal practice is to have them "change shifts" periodically. For the men working 7 days per week, it will be seen that some special arrangement is necessary to permit this change to be made without in any way interfering with the furnace operations. The usual plan is to have one of the shifts on the day of change work continuously through the 24 hours, performing not only their own duties but that of the other shift which is resting during this time. In this way, when the other shift returns to work, it has been changed from day work to night work, or vice versa. For example, if the change were made on Sunday, the day shift of that week, which came to work at 6 o'clock Sunday morning, would remain on duty for 24 hours or until 6 o'clock Monday morning, when it would be supplanted by the night shift of the previous week, but after 12 hours' rest following its 24 hours on duty would return to work Monday night and continue working nights for the rest of the week. The night shift of the previous week has in the meantime become the day shift, going on duty Monday morning and continuing to work days only until the next change of shift. These changes of shift are usually made every two weeks, although in some plants they are made weekly. In this way, during the week on which the shifts are changed, one of the shifts works 96 hours while the other works 72, giving an average working time of 84 hours per week. During the 2 days over which the change of shift extends, one set of men works 36 hours of the 48 with only 12 hours outside the plant.

It should be noted that in addition to the very long hours worked under this system, and the fact that men are on duty continuously for 24 hours, it is necessary for a man to change his habits of eating and sleeping absolutely every week or two weeks, and accustom himself to sleeping during the day immediately after finishing his "long turn" of 24 hours.

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The change of shift is accomplished in some few plants by a different division of the hours on the day that the change is made. The usual method is to have one of the shifts work out its full 12 hours and continue through the first 6 of the next turn, making 18 hours of continuous work. The other shift rests during this 18 hours and then returns to take up the work and continue for 18 hours of continuous work, and thus bring about a complete change of the shifts.

This plan has the advantage of avoiding the 24 hours of continuous duty, but also deprives the men of the one free day every month or two weeks which is secured by the other scheme. It also has the advantage of giving the men a longer rest following the "long turn." There is a great difference of opinion among the men, however, as to which system is preferable, as neither in any way reduces the total number of hours worked or gives the men more than one free day in two weeks or a month. To secure the full day off every two weeks, it is necessary that a man should change his habits of eating and sleeping every week.

It is true that the majority of the men around the blast furnaces are not busy continuously during the entire time they are on duty, the working time for the greater number being not more than three-quarters of the time they are in the plant, and for some not much more than one-half. During the intervals of one or more hours which occur between the periods of active work, the men are able to secure a certain amount of physical rest. It is only in rare instances, however, that they are permitted to leave the plant while they are on duty, except during the "long turn," when many plants allow them to go home for an hour or more to secure one hot meal in the 24 hours. These intervals of rest, although unquestionably greatly relieving the physical strain of the excessively long hours, have no bearing whatever on the fact that the men are in the mill half of their lives and more than three-quarters of their waking time.

GENERAL DESCRIPTION OF EQUIPMENT AND METHOD OF OPERATION.[1]

The blast furnace is the fundamental department of the iron and steel industry, as it is the only means used under modern conditions for producing pig iron from iron ores. Steel of good quality may be made in sufficient quantities for commercial use by either the Bessemer or the open-hearth process, nor are we absolutely dependent on any single one of the methods of working and shaping iron and steel, but, except for the very remote promise held out by the electric furnace, the entire steel industry would be powerless to supply modern necessities without the blast furnace. To produce the enormous quantities of pig iron necessary requires the investment of

[1] The description given here, as well as those for other departments, though drawn from a number of sources is largely based upon and in part adopted from the Pocket Encyclopedia of the Iron and Steel Industry, published within the last year by Hugh P. Tiemann.

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much larger capital and the employment of a much larger force than any other single department of modern industry. Furthermore, the blast-furnace plants are widely spread geographically, there being some plants of importance in nearly every section of the country.

The blast furnace proper, with the general appearance of which nearly everyone is familiar, is a shaft-like structure, supplied at its bottom with a blast of air which acts on the fuel within the furnace to create a temperature in which the iron ores are reduced by the action of free carbon and carbon monoxide in the presence of a flux. It is continuous in operation, the solid raw materials (ore, fuel, and flux) being charged at the top and the molten pig iron and cinder (slag) removed (tapped out) at the bottom at intervals.

The modern equipment consists essentially of the furnace proper or stack, blowing engines for compressing the air for the blast, stoves for preheating the blast, appliances for charging the raw materials, and finally means for disposing of the molten iron.

On the same side of the stack as the tap hole is the cast house, on the floor of which the molten metal and slag is run out and disposed of either by casting or in ladles. Of the stack there are three well-defined divisions, usually circular in section. At the bottom is the hearth of cylindrical shape, in which the molten metal and slag collects. Above this the walls diverge and form an inverted truncated cone called the bosh, in which, roughly speaking, the metal comes to a state of fusion and is reduced; and above this the walls converge to the top (throat or mouth), forming another truncated cone set upright, the temperature becoming lower and lower as we go upward until at the very top it has little if any effect on the materials.

The furnace is built of fire brick and is usually incased in a steel jacket extending part or all the way up. Up to a certain distance from the bottom of the furnace the walls are protected from corrosion by cooling plates of bronze or other metal through which water circulates. Sometimes water is caused to flow down the outside or, as in the most modern furnaces, the entire stack is water-jacketed. Large furnaces are about 80 to 100 feet high, and the height is usually 3 or 4 times the largest diameter. They commonly produce 300 to 500 tons of pig iron per day, for which they employ a blast at a normal pressure of from 10 to 15 pounds per square inch and at a temperature of about 900° to 1,400° F. Formerly the blast was used cold, but this practice is now restricted to a few small furnaces, which, as a rule, employ charcoal for fuel. The use of the hot blast was introduced by Neilson about 1828 and effected a great economy in fuel. The blast is such a tremendous factor that its importance can best be made evident by noting that about 4 or 5 tons of air must

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actually be supplied to the furnace for every ton of pig iron produced.[1] To deliver this quantity of air to the furnaces under a pressure which may be as high as 25 pounds per square inch, large stationary compressing engines (blowing engines, blast engines) are used, the greatest number of which are still steam driven, although a rapidly increasing number of gas engines are being installed. These engines are usually situated in a large separate building (engine house) near the furnaces, the blast being conveyed in large overhead mains to the stoves, where it is heated to a high temperature by the heat from the waste furnace gases before being introduced into the furnace.

After passing through the stoves the blast, now at a temperature of over 1,000° F., is brought in mains to a large pipe (bustle pipe), 2 or 3 feet in diameter, which encircles the furnace at a height of 10 to 15 feet above the cast-house floor. At regular intervals around the circumference of the furnace this bustle pipe is tapped by smaller pipes which convey the blast into the furnace. In order to protect these pipes from injury by burning at the point where they project into the furnace (the "tuyere" proper), they are incased in water-cooled metal castings somewhat like the water jackets of a gas engine. The entire system from the bustle pipe down is frequently spoken of as the "tuyere." Each of the tuyere pipes has a small hole (the "peephole"), closed by isinglass or blue glass, through which the "blower" or "keeper" can look to see the condition of the inside of the furnace.

The gas formed within the furnace by the combustion of the coke was formerly allowed to escape through the top of the furnace, the whole of its heating power thus being lost. It was seen nearly a century ago, however, that this gas could be utilized to heat the blast before it entered the furnace and thus render it much more efficient, besides effecting a great economy in fuel. It is therefore arranged now that the top of the furnace, where the material is charged, is closed by a hollow iron cone, the "bell" (or in all modern furnaces by a combination of two bells), which is pressed upward against the opening in the top of the furnace when no materials are being charged, and thus prevents the escape of the gas, but which may be dropped by lowering the lever to which the bell is attached and thus allow the materials which have been dumped on it to fall into the furnace, after which the bell is raised automatically by a counterweight on the other end of the lever. The gas is taken off near the top of the furnace through one or more openings, each connecting with a large pipe (downcomer) which leads to a large chamber (dust catcher) near the ground, where most of the dust (flue dust)

[1] See Stoughton, The Metallurgy of Iron and Steel, 1908, p. 27, where it is also stated that 1,000 cubic feet of air at 70° F. and atmospheric pressure weighs 75 pounds. On this basis and counting 2,000 pounds to the ton, 4 to 5 tons of air would represent a volume of about 107,000 to 133,000 cubic feet.

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carried by the gas is deposited. In many modern plants the gas is then led to a chamber (gas washer) where it is purified by being passed through water or over moistened bricks. This renders the gas suitable for use in gas engines for generating the blast and also makes it more efficient for use in the "stoves," to which a part at least of the gas is next carried in large mains.

These stoves are cylindrical in form, 100 feet or more in height, and consist of a steel or iron shell filled with fire bricks set in such a way (checkerwork) as to leave a number of small flues or passages between them. The stoves are regenerative in principle, that is, the furnace gas is introduced near the bottom and there burned, and as it passes up through the flues to the top heats the fire brick until they are red-hot. The gas is then turned off from this stove and into another one (there are usually four to a furnace, three being in use at any one time, while the fourth is kept for emergencies). Into this red-hot interior of fire brick the blast is next admitted and is raised to a high temperature by literally "soaking up" the heat before passing into the furnace. This process of alternately admitting gas and air to each stove is repeated continuously, the air being passed through a fresh stove about every half hour.

The molten iron as it is reduced from the ore inside the furnace falls to the bottom of the "hearth" at which point a hole (some 6 inches in diameter) pierces the blast furnace wall. This hole is known as the tapping hole or iron notch, and is closed, except when tapping (casting), by ramming it with wet clay, which is hardened almost immediately by the heat of the furnace. Through this hole, when the furnace is tapped, the molten iron and slag run out in a stream to the furnace floor (casting floor, cast-house floor), where it is led by troughs (runners) into ladles or into molds which form it into "pigs." As the slag forms very rapidly within the furnace, on account of the large amount of flux necessary to reduce the iron ores, it is necessary to tap it off twice or more between the "casts" of metal. For this purpose a hole through the furnace wall is provided near the top of the hearth and on one side of the furnace. This hole is known variously as the slag notch, cinder notch, flushing hole, or cinder monkey. When the slag is tapped, it is led by troughs (cinder runners) to ladles or into pits.

There are two methods by which the material is charged at the top of the furnace. The older method, which is still in use, though seldom employed for new furnaces, consists in loading the materials into wheelbarrows (charging buggies) which are then raised to the top of the furnace by an elevator, and there wheeled off the elevator and dumped into the furnace hopper by men known as top fillers. In the modern method, the materials, in large proportions, are

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loaded into the "skip" (a small car or bucket) which is then hoisted to the top of the furnace up an inclined track (skip bridge) and there automatically dumped into the furnaces.

OPERATION.

Having thus described the general appearance of the blast-furnace equipment and parts and indicated their function it is well in order to reach a clear notion of its operation to follow briefly through all its steps the process of making iron.

STOCKING.—The iron ore is received at the furnace plants either in ships, or, as is generally the case also with coke and limestone, in freight cars. When the ore is received in boats, it is unloaded by special machines of enormous capacity and deposited on the shore in large piles. If the materials come by rail, the cars are run either on trestles, where the materials are dumped or shoveled into huge piles, depending upon whether open-bottom or old-style gondola cars are used, or on a car dumper, which is a massive machine capable of picking up a loaded freight car and dumping its contents. From these piles the ore is usually scooped up by the grab buckets of enormous traveling cranes (ore bridges), having a span of several hundred feet, and carried to the point where it is dumped into other piles, from which small cars (transfer cars) finally remove it to the "bins" of the "stock house," from which it can easily be drawn as needed for the furnace. In many plants the materials are not handled so many times but are dumped directly into the stock-house bins or in piles near by.

CHARGING.—As the materials are needed they are drawn off by chutes in the bottom of the bins into wheelbarrows or (the more usual method at present) into small electric-drawn hopper-bottom cars (larries, scale cars) usually equipped for weighing automatically. When barrows are used the material contained is first weighed and then put on the elevator to be hoisted to the top of the furnace or dumped into the "skip." Larries, however, are never used except in conjunction with the skip method of charging. The materials are usually charged separately, that is, a skip full of ore is followed by one of coke, etc., but in a few cases they are mixed first. When the materials are dumped at the top of the furnace, as has been explained above, they do not fall directly into the furnace but on top of a "bell" (or in modern furnaces on the uppermost of two bells) which closes the bottom of the hopper. When sufficient material is dumped on top of the bell, it drops automatically by the weight of the charge or is lowered either by the top fillers or, in modern furnaces, by the man who operates the skip. It is essential that the materials should be evenly distributed as they fall into the furnace. In the older type this was easily accomplished by requiring the top fillers to deposit

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it at regular points around the circumference of the hopper, but in the modern furnace it has been necessary to invent a number of devices, deflectors and rotating bells or tops being the most frequent types.

As the materials pass down into the furnace the coke is ignited and burns, creating a temperature which in the presence of the limestone flux fuses the iron ore. The combustion of the coke also generates large quantities of carbon monoxide gas which, together with free carbon, acts chemically on the ore to reduce it to metallic iron.

CASTING.—This iron being more and more reduced of its oxygen, and at the same time absorbing carbon and various impurities, as it passes down in the furnace, finally reaches the bottom of the hearth, where it forms a large molten bath, on top of which the slag floats. The iron, as explained above, is tapped off through the tapping hole from 4 to 6 times in 24 hours, while the slag is tapped out more frequently. The clay with which the tapping hole is closed becomes very hard and is removed by having the men of the casting crew (keeper and helpers) drill it out with a large iron bar. Within recent years a pneumatic drill has been devised which goes through the clay much more rapidly and does not require so many men. In the floor of the cast house, on which the iron pours out of the tapping hole, are formed troughs (runners), either of sand or of iron castings lined with clay, by which the metal is led to the molds which form the "casting bed" or into ladles in which it can be hauled away by a locomotive, either to be made directly into steel by the Bessemer or the open-hearth process, or, if it is not wanted directly, to be more economically cast into pigs by the "pig machine." There are several types of this machine, but all consist essentially of an endless chain of iron or steel molds which pass continuously before a ladle from which is poured into each of them the proper quantity of molten metal to form a pig. The molten metal is cooled by passing the molds through water, after which the molds are easily dumped by turning them upside down.

DESCRIPTION OF OCCUPATIONS.

In the following description of occupations the main occupation name shown represents the term retained in the report and under which data as to wages and hours of labor are presented. The names shown in parenthesis represent the most important minor occupations included under the name used in this report as well as other terms used in various establishments to indicate the same class of work. In the first paragraph, "Duties," is given a description of the functions which employees in the occupation perform and the method by which the work is done. In the second paragraph, "Nature of work," two points are covered—first, an indication of the type of

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workman required for the position, and, second, the conditions under which the work is done. The order in which the occupations are given follows that of the processes of manufacture.

CAR-DUMPER OPERATORS.

DUTIES.—When ore and other materials are received in freight cars, the cars are emptied either by the stock laborers or by a car dumper, a huge machine which picks up and dumps an entire carload of material at each operation. Car-dumper operators operate the levers controlling the hydraulic mechanism of the device and also adjust the clamps to cars of different sizes.

NATURE OF WORK.—Responsible position, demanding considerable mechanical ability.

ORE-BRIDGE OPERATORS.

DUTIES.—Operate ore bridges—traveling cranes of gigantic dimensions used for handling ore in large quantities from dump to stock piles.

NATURE OF WORK.—Control the movements of the ore bridge on its track and also the movement of the suspended grab bucket by which the ore is picked up and transferred from one end of the bridge to the other. May be considered as high-grade cranemen. The position requires considerable skill and experience because of the size of the crane and the speed with which materials are handled.

TRANSFER-CAR OPERATORS.

DUTIES.—Operate controllers on electric transfer cars used for transferring materials to the stock-house bins from stock piles made by the ore bridge or by dumping freight cars.

NATURE OF WORK.—The work requires some experience and skill. The work is analogous to that of motor men.

LABORERS, STOCK.

(Including Stock Unloaders; Stockyard (house) Laborers; Trestle Men; Wrenchers; Car Dumpers; Bin Men).

DUTIES.—Unload cars containing ore, coke, limestone, or other materials; handle materials in stock piles and bins; the designation also includes helpers to car dumper, ore bridge, and transfer-car operators. Duties include shoveling ore from stock cars, dumping hopper cars, breaking ore and other materials, and tending bins.

NATURE OF WORK.—Very diversified, but almost altogether performed by unskilled laborers. Rates of wages vary chiefly in relation to amount of physical work done.

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SCRAP MEN.

(Including Scrap Pickers; Scrappers.)

DUTIES.—Pick scrap left in the runners after casting, or collected in the yards, and load it into the "skip" or charging buggies.

NATURE OF WORK.—Requires no large amount of manual labor or skill, and in some places is performed by boys.

LARRY MEN.

(Including Larry-Car Operators; Scale-Car Operators; Motor Men, stock house.)

DUTIES.—Draw, weigh, and transfer ore, limestone, coke, and other materials from bins of stock house to the "skips." Operate levers controlling electrically driven cars and mechanism opening and closing dumping bottom. Get stock from proper bin at direction of foreman and have it weighed before delivery to the "skip." If automatic weighing "scale" cars are used, must get proper amount of material from bin and record weight as indicated.

NATURE OF WORK.—The work is quickly learned, and is analogous to that of low-grade motor men.

LARRY MEN'S HELPERS.

DUTIES.—Assist larry men by keeping tracks clean; by loosening stock in bins where it sticks; by operating switches on larry tracks, and by doing other required work.

NATURE OF WORK.—Work performed by common, unskilled laborers. Little heavy manual labor.

BOTTOM FILLERS.

(Including Barrow Men; Ore, Coke, or Stone Fillers; Buggy Men; Buggy Pullers; Bottom Fillers' Helpers.)

DUTIES.—Where larry cars are not used, bottom fillers transfer materials from stock piles or bins to furnace hoist with wheelbarrows, which they put on elevators in plants using hand-charged furnaces or dump into the "skip" in plants using mechanically charged furnaces. In tables, the designation includes bottom fillers' helpers, who shovel materials into barrows and in some plants spell bottom fillers.

NATURE OF WORK.—Heavy, fairly continuous work, with short rest periods from time to time and performed by unskilled laborers. Work ordinarily made easier by having floor on which they work slope slightly toward furnace, so that gravity helps to carry loaded barrows down.

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CAGERS.

DUTIES.—On hand-charged furnaces, supervise putting of barrows on elevator hoist, and signal top fillers when to hoist elevator; also keep record of charges. On mechanically charged furnaces, supervise filling of the "skip" by means of which furnace is charged, and signal skip operator; also keep record of charges. In some plants, however, skip operators perform all three duties.

NATURE OF WORK.—In either case, work is supervisory and clerical, of not very high grade.

SKIP OPERATORS.

(Including Engineers, skip; Skip Motor Men; Skip Men; Hoist Engineers; Bellmen.)

DUTIES.—Operate engine or motor by which "skip" is hauled up the inclined runway to the top of the furnace Also operate mechanism which lowers the bell by which materials are dumped into the furnace. Frequently required to keep record of charges, and thus eliminate the cagers.

NATURE OF WORK.—Are either stationary engineers of comparatively low grade or motor tenders. In modern furnaces having mechanical stock distributing devices, the position is one of responsibility, because the distribution of the charge in the furnace is under the care of these operatives. The distributing devices usually consist in some form of deflector or revolving tops or revolving bells, controlled from the "skip house."

TOP FILLERS.

(Including Topmen; Top Chargers.)

DUTIES.—On hand-charged furnaces operate the elevator or vertical hoist by which the barrows of materials are drawn to the top of the furnace; dump the material from these barrows into the furnace hopper, and operate the mechanism by which the bell at the bottom of the hopper is lowered, allowing the materials to fall into the furnace.

NATURE OF WORK.—Hard physical labor, done at an elevation and in most plants exposed to the weather. In summer the heat is extreme, and the liability to partial or complete asphyxiation by the poisonous furnace gases makes it necessary to relieve these men at frequent intervals. Furthermore, it is a position of considerable hazard in case of explosions or of "slips."

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BLOWERS.

(Including Founders; Foundry Men; Foremen, cast house; Foremen, front side; Foremen, furnace; Overseers.)

DUTIES.—In charge of the working of furnaces and responsible for the quantity and quality of the output. Determine the proportion of the materials charged, the pressure and temperature of the hot blast, and the time and manner of tapping. The entire blowing and casting force is under the direction of a blower.

NATURE OF WORK.—The work is largely supervisory and is similar to that of a foreman. It requires, however, considerable practical metallurgical knowledge and frequently demands a great deal of manual work.

STOVE TENDERS.

(Including Hot-blast Men; Stove Men; Hot-oven Men.)

DUTIES.—In charge of the regenerative stoves in which the blast is heated by the waste furnace gases. They change the stoves periodically (usually every half-hour) by admitting air into those in which the brickwork is hot and gas into those that are to be heated. In some plants, with the assistance of a gang of laborers, stove tenders clean the stoves. In some plants they tend the furnace water-cooling system and have other minor duties on cast-house floor.

NATURE OF WORK.—Steady but comparatively easy work, consisting chiefly in manipulating the valves by which the flow of gas and of air is controlled. The work requires some experience but relatively little technical knowledge or training.

STOVE CLEANERS.

(Including Stove Tender's Helpers.)

DUTIES.—Remove the cinder, dust, and various débris that accumulate in the stoves.

NATURE OF WORK.—This work is not heavy, and requires little skill or training, and the positions are usually filled by unskilled laborers.

BLOWING ENGINEERS.

(Including Blast Engineers.)

DUTIES.—In direct charge of steam blowing engines and, under the direction of the blower, regulate the pressure of the blast.

NATURE OF WORK.—The work is that of a stationary engineer of the highest grade, and the position is one of considerable responsibility, although the modern blowing engine works with such uniformity that little attention is required.

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BLOWING ENGINEERS' ASSISTANTS.

(Including Second Engineer; Third Engineer.)

DUTIES.—Assist blowing engineers.

NATURE OF WORK.—The work is that of a low-grade stationary engineer, and the position may be considered as a training for the higher position of blowing engineer.

GAS WASHERMEN.

DUTIES.—Tend apparatus by which furnace gases are washed before being used in the gas engines or under the boilers, and, in some plants, before being returned to the stoves.

NATURE OF WORK.—Comparatively simple and slightly skilled work. Types of gas washers differ widely in construction and in mode of operation.

DUSTMEN.

(Including Flue Dust Laborers; Dust Wheelers; Dust Catcher Men.)

DUTIES.—Remove the dust which accumulates in the gas flues and in the dust catcher.

NATURE OF WORK.—Requires no skill, but disagreeable on account of the hot dust, and likely to be dangerous if dust is not thoroughly wetted down while being removed.

KEEPERS.

DUTIES.—Superintend and take part in tapping the iron and cinder from the furnace, the greater part of the actual work—drilling the hardened clay out of the tap hole—being done by the keepers' helpers and cinder snappers. The keepers in many plants hold the bar by which the clay is removed or operate the compressed-air drills for accomplishing the same purpose. While the metal is being run the keepers direct the flow of metal into the ladles or into the sand bed, and often do much of the work. After the cast they direct the work of closing the tap hole with clay, and in many modern plants operate the "mud gun" by which this is accomplished. They and their helpers are exposed to danger from furnace break outs, explosions of metal, and premature tapping, as well as liability to asphyxiation by furnace gases.

NATURE OF WORK.—The position of keeper is one of responsibility, requiring considerable experience, and at the same time carrying with it much hard work and exposure to heat during the tapping of the metal and cinder. The position may be regarded as one of training for the higher and more responsible position of blower. The keeper acts as blower in case the latter is absent, and in some places regularly performs the duties of blower on the night turn. The work of the

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casting crew (keepers, keepers' helpers, and cinder snappers) is intermittent under ordinary conditions, since the work is done only in preparation for and during the casts (except for the tapping of cinder). These casts occur only every four to six hours under normal conditions, and the actual time that the crew is busy during a turn therefore varies from about 60 to 80 per cent. The draining of the cinder varies in frequency according to the size of furnace and to the nature of materials charged, which affects the amount of work done.

KEEPERS' HELPERS, FIRST.

(Including First Helpers; First Runner Men; First Casting Men; First Trough Men; First Cast-house Men; Sand Cutters.)

DUTIES.—Work under the direction of the keeper in tapping the furnaces, running the metal, and cleaning up and preparing the casting floor. Commonly swing the "splasher" into place over the tap hole and are in charge of the "skimmer" and first runner gate during the cast. The work is divided up in different ways in different plants, however, and the difference in rates paid is largely one of experience and as marking the advance to the responsible position of keeper; also in many establishments no differentiation of duties or rates is made, which makes it necessary in this report to carry the designation "keeper's helpers, not specified."

NATURE OF WORK.—The work is heavy and very hot during the time of the cast, especially where the iron is cast in sand beds. Only a little experience is required, however, and the position is commonly filled by strong, unskilled laborers. The amount and difficulty of the work of all keepers' helpers are largely determined by whether the metal is run into sand beds or into "chills" on the casting floor, either of which requires a great deal of preparation, or whether it is run into ladles. In the case of the sand beds, the mold and the runners must be carefully cut and molded in the sand with wooden patterns, which takes a great deal of time. When iron molds and runners are used it is necessary to give them a clay wash only. In either case, however, the amount of work done per man is largely equalized by employing a larger crew on the sand beds. For amount of actual time at work see "keepers."

KEEPERS' HELPERS, SECOND.

(Including Second Helpers; Second Runner Men; Second Trough Men; Second Cast-house Men; Second Casting Men.)

DUTIES.—Work under the direction of the keeper in all the operations of casting. Help swing the heavy drill where the work is done by hand; during the cast are in charge of the runner gates leading to

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the ladles, and after the cast clean up the hot scrap and cinder, and prepare the bed and the runners for the next cast. (See keepers and keepers' helpers, first.)

NATURE OF WORK.—The work is hard and heavy and can be filled only by strong men. Requires little experience and is filled by unskilled laborers. Besides the danger and discomfort alluded to under the head of "keepers" this position carries special liability to burns from flying particles and to burned feet and hands from the hot metal.

KEEPERS' HELPERS, THIRD, AND CINDER SNAPPERS.

(Including Third Helpers; Third Runner Men; Third Trough Men; Third Casting Men; Third Cast-house Men; Cinder Snappers; Cinder Men; Slag Men; Monkey Men.)

DUTIES.—Take part in all the operations of casting and perform much the same work as the second helpers. Especial duty is connected with the tapping of the "cinder notch," which is opened periodically with a bar, and closed after the slag has been drained by holding a bar in the hole, which serves to chill and solidify the cinder, or by ramming a ball of damp clay into the hole. The work of looking after the cinder notch is frequently specialized and the men who do the work are called cinder snappers, but the two duties are so frequently combined that they are included with keepers' helpers, third, in this report. At the time of the cast the special duty of third helpers is to direct the flow of cinder from the main to the side runner, using a long bar for this purpose. Also frequently perform duties of clay men and barmen.

NATURE OF WORK.—Very hot and heavy work during the cast. In all features the work is like that of the keepers' helpers, second, described above. The difference in rate of wages is due chiefly to experience and physique. The conditions of heat under which the entire casting crew works vary with size and arrangement of the particular furnace, but they are chiefly influenced by whether the iron is cast in sand beds (the older method, though still used to a considerable extent), in which case the temperature to which the crew is subjected during the cast is extremely high, or whether the iron is run into ladles, in which case the heat though still high during the cast is greatly relieved.

KEEPERS' HELPERS, NOT SPECIFIED.

DUTIES.—Classification used to cover those cases where no differentiation of duties or wages are shown.

NATURE OF WORK.—For the duties, nature of work, etc., see keepers' helpers, first, keepers' helpers, second, and keepers' helpers, third and cinder snappers.

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CLAY MEN AND BARMEN.

(Including Toolmen and Clay Men.)

DUTIES.—Clay men prepare and deliver clay for stopping tap hole, and where chill runners or molds are used prepare and deliver the clay wash. Barmen look after the bars and other tools used in casting and carry them to the blacksmith to be sharpened. The duties of clay men and barmen are frequently united.

NATURE OF WORK.—Both positions are relatively unskilled, particularly that of barmen. Both are light and carry with them a good deal of leisure.

TUYERE MEN.

(Including Furnace Water Tenders.)

DUTIES.—Fit and change "tuyeres" (the water-cooled pipes through which the blast enters the furnace); regulate and keep in repair the water-cooling system by which the lower part of the furnace or "bosh" is kept cool. In many plants no separate occupation is carried for this work, which is done by pipe fitters whenever necessary.

NATURE OF WORK.—The work is largely that of pipe fitters. Although employed around the furnace, many of the conditions of danger and discomfort mentioned as applying to keepers and their helpers do not apply to the tuyere men. They are not on the floor during the cast, except in emergencies.

IRON BREAKERS.

(Including Breakers; Pig Breakers.)

DUTIES.—When iron is cast in sand beds, the iron in each of the molds is known as a "pig," and that in the "runner" by which iron is led to the mold is known as the "sow." It is the duty of the iron breakers to shovel sand over the molten iron, spray it with water, break the pigs from the sow, and to break the sow into convenient lengths. In some establishments where the work is not specialized they also perform the duties of iron handlers. In modern plants where the iron is used in a molten condition or cast in pig machines, this work is entirely eliminated.

NATURE OF WORK.—The work is done with heavy sledges and bars and is very hard manual labor; but it is usually arranged that these men are relieved by "spell hands" or do lighter work during the intervals between casts. Furthermore, they are usually allowed to go home as soon as their daily task is completed, so that the actual amount of working time for this occupation is not over 10 hours per day, and frequently is less than 10 hours.

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IRON HANDLERS AND LOADERS.

(Including Iron Carriers; Iron Stowers; Iron Pilers; Off-bearers.)

DUTIES.—Remove and carry the iron from the casting floor and pile it in the yard or load it on cars. This work is frequently divided between two occupations: Iron carriers, who remove the iron from the casting floor; and iron loaders, who load it on cars. The work is essentially the same for both occupations.

NATURE OF WORK.—Heavy manual labor, requiring little more than strength and endurance. The work is usually intermittent in character though in some places it is arranged that they work continuously for shorter hours. In the most modern plants the iron is loaded directly from the pig machine or from the piles with magnet cranes.

IRON GRADERS.

DUTIES.—Classify the iron on the basis of the appearance of the fracture. This occupation is now largely displaced by chemical analysis.

NATURE OF WORK.—Amount of skill and experience demanded is determined largely by the accuracy with which it is necessary to do the work. Hence rates of wages vary widely. The work involved is light.

PIG-MACHINE MEN.

(Including Casting-machine Men; Pig-machine Operators, Pig-machine Helpers; Pourers; Turndown Men; Ladle Men; Pig Pourers; Trough Men; Mold Washers; Pig Stickers; Pig-machine Laborers.)

DUTIES.—Include several distinct occupations not ordinarily given distinct names or paid widely different rates. The ordinary pig machine consists of a series of molds mounted on an endless chain into which molten iron is poured from a ladle. Therefore, iron pourers operate mechanism which pours metal from ladles. Varies from a very hot, hard job to a comparatively easy and comfortable one, depending on local arrangements. Runner men see that the trough from ladle to molds is kept clear. Very hot and dangerous work, as the position occupied is directly alongside the ladle and the runner. Lime men wash or sponge lime or clay wash on molds to prevent iron from sticking. Comparatively light work. Knockers out remove with a sledge or bar any pigs that stick in the molds. If machine runs properly, the work is light, but if many molds stick, it is very hard work.

NATURE OF WORK.—The work varies largely in character according to the type of the machine and the particular occupation. Furthermore, many of the pig machines are operated Saturday night and Sunday only, the men being employed at other work for the remainder of the week.

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LADLE MEN.

(Including Pot Men; Kettle Men; Skullers; Ladle Patchers.)

DUTIES.—Two separate occupations are included under this designation, but as they are not ordinarily specialized they have been combined. Ladle cleaners remove the slag and "skulls" of metal and cinder from the ladle. Ladle liners repair or replace the brick lining of the ladle. The complete relining, however, is frequently done in connection with the open-hearth or Bessemer work, where there is special equipment for it.

NATURE OF WORK.—The work varies widely in character; in the case of the ladle cleaners the work is unskilled, but hard and heavy. If the ladle is merely patched by smearing clay over any slight break in the inner lining, it is comparatively unskilled work. If, however, the ladle requires a complete lining the work is done by bricklayers of considerable skill. Few of the latter, however, are reported under this head.

CRANEMEN.

(Including Crane Operators; Crane Runners.)

DUTIES.—Include the operation of all cranes except locomotive cranes and ore bridges. These are chiefly electric cranes, most of them being of relatively small size.

NATURE OF WORK.—The amount of skill and experience required vary widely according to the type and size of the crane and the use to which it is put. In general, however, the requirements are experience and a clear head.

ENGINEERS, STATIONARY.

(Including Engine Runners.)

DUTIES.—Operate various small stationary engines used for hoisting, running the pig-casting machines, pumps, condensers, gas washers, and other appliances.

NATURE OF WORK.—The nature of the work and the conditions of work are largely determined by the function performed by the engine of which the men have charge. As a general rule are low-grade stationary engineers.

CINDER MEN.

(Including Cinder-dump Laborers; Cinder Laborers; Cinder Loaders; Cinder Men; Slag Men; Pitmen: Cinder Yardmen; Cinder Machine Laborers; Cinder Coolers.)

DUTIES.—Include the laborers handling the cinder at and on its way to the cinder dump; also a smaller number of laborers cleaning up the cinder pits and cleaning away cinder around the furnaces not cared for by the cinder snappers.

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NATURE OF WORK.—Varies greatly in severity, some of that on the cinder dump being very hard and disagreeable, while other, such as much of the cleaning up, is comparatively light and easy. The rates paid and the class of labor used, therefore, vary widely.

LABORERS, OTHER.

(Including Ash Wheelers; Boiler Tenders' Helpers; Carters' Helpers; Car Trimmers; Cleaning up; Gas-washer Helpers; Scale Men's Helpers; Slag Breakers; Sweepers; Toolmen, Yard Laborers, etc.)

DUTIES.—Include the large number of minor and unspecialized occupations which require no skill or experience. In making up this class in this and other departments, the attempt has been made to have it include only those positions which may be filled by what is known as "common labor," where there are no special requirements of physique or experience.

NATURE OF WORK.—The work is all unskilled, but varies from comparatively hard, continuous labor to light, intermittent labor. The conditions of work, also, vary widely but are generally those of moderate temperature and of no special occupation hazard.

UNCLASSIFIED.

(Including Braize-machine Operators; Dock Hoisters; Drillers; Estimators; Gripmen; Hook Men; Inspectors of various kinds; Concrete Men.)

DUTIES.—Include a large number of special or local occupations as well as a few that could not be identified.

NATURE OF WORK.—The work varies so widely that no comment is possible.

EARNINGS AND HOURS AND DAYS OF WORK, BY OCCUPATIONS.

EARNINGS PER HOUR.

Data relative to earnings per hour for each occupation and each plant are shown in detail in Table I, Volume II, and for each occupation and each district in Table II. Table I shows for each plant separately customary number of working days per week, customary number of working hours per day, normal number of employees, average earnings per hour, and number of employees earning each classified amount per hour. Table II shows for each occupation and each district the number of plants reporting data, the number of employees included, and the average earnings per hour. The table is so arranged that a comparison is easily made of the earnings of time workers and of tonnage workers in the different occupations within each of the districts and also of the earnings of each of the two classes of workers in the several districts.

The tables here presented summarize the information concerning earnings. The table which follows is a summary of Table II, with

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the exception that time workers and tonnage workers are not shown separately but are combined. The table is so arranged that a comparison is easily made of the earnings of any occupation in all of the districts and also a comparison of the earnings of the various occupations within a district.

AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY DISTRICTS—BLAST FURNACES.

Occupations.	New England district.	Eastern district.	Pittsburgh district.	Great Lakes and Middle West district.	Southern district.	Total.
Blowers:						
Plants	5	23	39	23	40	130
Employees	8	51	133	74	88	354
Average earnings per hour.....cents..	31.3	23.9	30.2	32.4	25.2	28.6
Blowing engineers:						
Plants	5	27	47	33	43	155
Employees	10	79	145	128	90	452
Average earnings per hour.....cents..	18.7	18.0	25.7	25.4	18.4	22.7
Blowing engineers, assistants:						
Plants	1	8	23	10	7	49
Employees	2	24	130	41	15	212
Average earnings per hour.....cents..	15.8	16.2	21.6	22.2	18.4	20.9
Bottom fillers:						
Plants	5	24	35	23	36	123
Employees	64	888	904	600	741	3,197
Average earnings per hour.....cents..	16.0	14.5	17.9	17.0	12.2	15.6
Cagers:						
Plants	2	4	12	15	15	48
Employees	4	10	42	57	39	152
Average earnings per hour.....cents..	16.8	15.0	18.0	17.8	13.4	16.6
Car-dumper operators:						
Plants	.....	.....	11	.....	.....	11
Employees	.....	.....	18	.....	.....	18
Average earnings per hour.....cents..	.....	.....	26.0	.....	.....	26.0
Cinder men:						
Plants	1	18	29	26	29	103
Employees	2	67	278	337	102	786
Average earnings per hour.....cents..	15.0	14.2	17.5	16.6	13.5	16.[illegible]
Clay men and barmen:						
Plants	1	6	29	23	9	68
Employees	3	16	78	78	10	185
Average earnings per hour.....cents..	17.4	14.1	17.2	16.6	11.1	16.3
Cranemen:						
Plants	.....	7	33	12	2	54
Employees	.....	16	166	55	4	241
Average earnings per hour.....cents..	.....	19.4	20.5	21.1	16.0	20.5
Dustmen:						
Plants	.....	5	14	7	6	32
Employees	.....	17	57	25	12	111
Average earnings per hour.....cents..	.....	12.9	16.9	16.5	11.0	15.6
Engineers, stationary:						
Plants	.....	7	29	14	8	58
Employees	.....	26	148	61	21	256
Average earnings per hour.....cents..	.....	16.4	22.2	22.5	15.2	21.1
Gas washers:						
Plants	.....	.....	6	4	.....	10
Employees	.....	.....	20	22	.....	42
Average earnings per hour.....cents..	.....	.....	20.5	23.7	.....	22.1
Iron breakers:						
Plants	.....	3	7	5	19	34
Employees	.....	22	29	43	106	200
Average earnings per hour.....cents..	.....	18.0	24.1	22.4	16.3	19.0
Iron graders:						
Plants	.....	1	2	6	9	18
Employees	.....	3	15	27	24	69
Average earnings per hour.....cents..	.....	16.0	18.0	19.9	15.9	17.9
Iron handlers and loaders:						
Plants	4	21	22	21	37	105
Employees	22	216	260	264	587	1,349
Average earnings per hour.....cents..	24.2	19.9	25.5	20.4	15.7	19.8
Keepers:						
Plants	5	27	47	34	43	156
Employees	10	91	212	152	103	568
Average earnings per hour.....cents..	17.9	17.9	23.6	22.5	15.9	21.0

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AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY DISTRICTS—BLAST FURNACES—Concluded.

Occupations.	New England district.	Eastern district.	Pittsburgh district.	Great Lakes and Middle West district.	Southern district.	Total.
Keepers' helpers, first:						
Plants	2	26	26	17	28	99
Employees	4	86	208	108	78	484
Average earnings per hour....cents..	16.4	16.0	19.4	18.7	13.7	17.8
Keepers' helpers, second:						
Plants	2	26	26	16	28	98
Employees	6	242	228	170	135	718
Average earnings per hour....cents..	15.8	15.0	18.2	17.9	12.6	16.3
Keepers' helpers, third, and cinder snappers:						
Plants	3	11	30	20	20	84
Employees	8	93	275	155	100	631
Average earnings per hour....cents..	14.9	14.3	17.3	17.6	12.6	16.3
Keepers' helpers, not specified:						
Plants	3	1	21	17	14	56
Employees	14	6	206	196	63	485
Average earnings per hour....cents..	17.3	14.7	18.9	18.7	12.4	17.9
Laborers:						
Plants	5	25	45	34	39	148
Employees	123	1,060	2,100	1,628	878	5,789
Average earnings per hour....cents..	15.5	13.6	16.4	16.2	12.0	15.3
Ladle men:						
Plants	.....	7	19	14	18	58
Employees	.....	95	136	131	52	414
Average earnings per hour....cents..	.....	15.1	18.3	17.4	13.7	16.9
Larry men:						
Plants	.....	4	20	19	5	48
Employees	.....	8	201	138	29	376
Average earnings per hour....cents..	.....	18.1	19.5	21.1	17.2	19.9
Larry men's helpers:						
Plants	.....	1	14	8	3	26
Employees	.....	2	177	84	25	288
Average earnings per hour....cents..	.....	15.4	17.1	16.6	13.5	16.7
Ore-bridge operators:						
Plants	.....	.....	17	11	1	29
Employees	.....	.....	61	65	1	127
Average earnings per hour....cents..	.....	.....	27.2	29.7	26.2	28.4
Pig-machine men:						
Plants	.....	4	24	12	2	42
Employees	.....	52	308	190	38	588
Average earnings per hour....cents..	.....	14.2	17.7	17.3	15.4	17.1
Scrap men:						
Plants	3	7	23	19	26	78
Employees	10	17	99	138	141	405
Average earnings per hour....cents..	15.3	13.8	17.3	16.4	11.7	15.1
Skip operators:						
Plants	.....	5	18	16	5	44
Employees	.....	12	95	77	19	203
Average earnings per hour....cents..	.....	16.6	19.6	20.4	15.3	19.4
Stockers:						
Plants	2	21	44	27	31	125
Employees	7	593	2,019	628	365	3,612
Average earnings per hour....cents..	15.4	15.4	17.2	17.1	12.9	16.5
Stove cleaners:						
Plants	.....	.....	24	13	3	40
Employees	.....	.....	78	75	11	164
Average earnings per hour....cents..	.....	.....	17.6	16.6	13.6	16.8
Stove tenders:						
Plants	3	23	46	29	35	136
Employees	6	71	216	134	90	517
Average earnings per hour....cents..	17.0	16.2	19.9	20.2	14.1	18.5
Top fillers:						
Plants	3	21	21	19	32	96
Employees	14	206	147	123	136	626
Average earnings per hour....cents..	20.8	15.4	21.4	19.6	14.6	17.6
Transfer-car operators:						
Plants	.....	1	11	7	.....	19
Employees	.....	2	31	26	.....	59
Average earnings per hour....cents..	.....	13.3	20.3	21.6	.....	20.7
Tuyère men:						
Plants	.....	1	19	6	2	28
Employees	.....	2	90	17	4	113
Average earnings per hour....cents..	.....	14.2	20.3	20.3	16.7	20.1
Unclassified:						
Plants	3	17	37	23	28	108
Employees	11	159	278	243	177	868
Average earnings per hour....cents..	16.6	14.4	19.0	20.0	15.3	17.7

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Only five plants in the New England district are included and therefore the number of employees in each occupation is too small for purposes of comparison, but from each of the other four districts a sufficient number of plants is included to permit a comparison of the earnings for practically all of the occupations. The employees are entered in the above table under 35 occupation classifications (including unclassified).

It is possible to make a comparison of average earnings per hour in the Eastern district, the Pittsburgh district, the Great Lakes and Middle West district, and the Southern district in each of 30 of the 35 occupation classifications. Average hourly earnings were on the lowest level in the Southern district, the next lowest in the Eastern district, considerably higher in the Great Lakes and Middle West district, and the highest in the Pittsburgh district. In the Southern district the average earnings per hour were lower than in any other of the three districts in 24 of the 30 occupations for which a comparison of the four districts enumerated is possible and in the remaining 6 occupations the average earnings per hour were lower in that district than in any of the other three districts except the Eastern. In the Eastern district the average earnings per hour were lower than in any of the other districts in 6 of the 30 occupations and lower than in any of the other three districts except the Southern in the remaining 24 occupations. In the Great Lakes and Middle West district the average earnings per hour were higher than in any of the other three districts in 10 of the 30 occupations, exactly the same as in the Pittsburgh district and higher than in either of the other two districts in one occupation, and lower than in the Pittsburgh district but higher than in the other two districts in 19 occupations. In the Pittsburgh district the average earnings per hour were higher than in any of the other three districts in 19 of the 30 occupations, exactly the same as in the Great Lakes and Middle West district and higher than in either of the other two districts in one occupation, and lower than in the Great Lakes and Middle West district but higher than in either of the other two districts in 10 occupations.

The next table compares the earnings of time workers and tonnage workers. In every case the tonnage workers received a higher rate than the time workers. This difference is particularly noticeable in the occupations of blowers, iron breakers, and iron handlers and loaders. The 334 blowers on time-work basis received an average of 28.1 cents per hour and 20 blowers on tonnage basis received an average of 36.6 cents per hour. The 176 iron breakers on a time basis received 17.8 cents per hour and the 24 on the tonnage basis received 29 cents per hour. The 992 iron handlers and loaders on the time

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basis received 17.5 cents per hour and the 357 on the tonnage basis received 25.4 cents.

COMPARISON OF AVERAGE EARNINGS PER HOUR OF TIME WORKERS AND OF TONNAGE WORKERS, BY OCCUPATIONS—BLAST FURNACES.

Occupations.	Time.			Tonnage.			Time and tonnage combined.		
	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.
Blowers	127	334	$0.281	4	20	$0.366	130	354	$0.286
Blowing engineers	155	452	.227	.....	.....	.....	155	452	.227
Blowing engineers, assistant	49	212	.209	.....	.....	.....	49	212	.209
Bottom fillers	123	3,177	.155	1	20	.206	123	3,197	.156
Cagers	48	152	.166	.....	.....	.....	48	152	.166
Car-dumper operators	11	18	.260	.....	.....	.....	11	18	.260
Cinder men	103	754	.163	1	32	.184	103	786	.164
Clay men and barmen	68	185	.163	.....	.....	.....	68	185	.163
Cranemen	54	241	.205	.....	.....	.....	54	241	.205
Dustmen	32	111	.156	.....	.....	.....	32	111	.156
Engineers, stationary	58	244	.210	1	12	.247	58	256	.211
Gas washers	10	42	.221	.....	.....	.....	10	42	.221
Iron breakers	29	176	.178	6	24	.290	34	200	.190
Iron graders	17	59	.177	1	10	.192	18	69	.179
Iron handlers and loaders	85	992	.175	32	357	.254	105	1,349	.198
Keepers	156	568	.210	.....	.....	.....	156	568	.210
Keepers' helpers, first	99	484	.178	.....	.....	.....	99	484	.178
Keepers' helpers, second	98	781	.163	.....	.....	.....	98	781	.163
Keepers' helpers, third, and cinder snappers	84	631	.163	.....	.....	.....	84	631	.163
Keepers' helpers, not specified	56	485	.179	.....	.....	.....	56	485	.179
Laborers	148	5,789	.153	.....	.....	.....	148	5,789	.153
Ladle men	58	414	.169	.....	.....	.....	58	414	.169
Larry men	47	356	.197	1	20	.247	48	376	.199
Larry men's helpers	26	288	.167	.....	.....	.....	26	288	.167
Ore-bridge operators	29	127	.284	.....	.....	.....	29	127	.284
Pig-machine men	42	588	.171	.....	.....	.....	42	588	.171
Scrap men	77	401	.151	1	4	.192	78	405	.151
Skip operators	44	203	.194	.....	.....	.....	44	203	.194
Stockers	122	3,405	.162	11	207	.217	125	3,612	.165
Stove cleaners	40	164	.168	.....	.....	.....	40	164	.168
Stove tenders	134	483	.183	2	34	.221	136	517	.185
Top fillers	96	626	.176	.....	.....	.....	96	626	.176
Transfer-car operators	19	59	.207	.....	.....	.....	19	59	.207
Tuyere men	28	113	.201	.....	.....	.....	28	113	.201
Unclassified	108	867	.177	1	1	.200	108	868	.177

The table which follows shows for each of the principal occupations the number of plants reporting, normal number of employees, average earnings per hour, and per cent of employees earning each classified amount per hour. The occupations are in order following the processes of manufacture.

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PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS—BLAST FURNACES.

Occupations.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Stockers	125	3,612	$0.165	2.60	12.90	13.57	56.12	10.27	4.51	0.03	.....	.....	.....	.....	.....
Bottom fillers	123	3,197	.156	12.45	13.86	30.06	24.24	17.70	1.69	.....	.....	.....	.....	.....	.....
Top fillers	96	626	.176	1.60	10.70	21.25	29.23	15.02	14.86	2.56	4.79	.....	.....	.....	.....
Blowing engineers	155	452	.227	.....	1.99	4.65	15.49	11.73	30.31	31.42	4.42	.....	.....	.....	.....
Stove tenders	136	517	.185	.39	8.32	13.93	13.35	25.34	38.68	.....	.....	.....	.....	.....	.....
Blowers	130	354	.286	.....	.....	.....	1.13	2.54	22.88	34.46	34.75	3.67	0.56	.....	.....
Keepers	156	568	.210	.....	4.23	10.04	6.69	17.96	57.92	3.17	.....	.....	.....	.....	.....
Keepers' helpers	155	2,381	.169	5.50	10.46	14.99	30.41	31.58	7.06	.....	.....	.....	.....	.....	.....
Iron handlers and loaders	105	1,349	.198	6.82	13.79	9.12	20.68	10.06	25.50	9.27	4.15	.59	.....	.....	.....
Cinder men	103	786	.164	3.94	7.51	21.63	54.45	11.96	.51	.....	.....	.....	.....	.....	.....
Laborers	148	5,789	.153	6.22	20.63	20.49	52.60	.....	.07	.....	.....	.....	.....	.....	.....
Other occupations [1]	.....	5,091	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
All occupations	156	24,722	.172	5.57	12.26	16.96	37.51	13.07	10.27	2.92	1.32	.11	.01	.....	.....

[1] Details not separately reported.

The blowers are the highest paid employees. The average earnings for the 354 was 28.6 cents per hour—34.75 per cent of the blowers earned 30 and under 40 cents almost an equal proportion (34.46 per cent) earned 25 and under 30 cents, and 22.88 per cent earned 20 and under 25 cents. The occupation of laborers includes the largest number of employees (5,789), and the average earnings per hour are the lowest—15.3 cents; 52.60 per cent of the employees in this occupation earned 16 and under 18 cents per hour, 20.49 per cent earned 14 and under 16 cents, 20.63 per cent earned 12 and under 14 cents, and 6.22 per cent earned under 12 cents per hour.

It should be noted that in spite of the very large number of employees listed as laborers this group does not include one-half of the unskilled employees of the blast-furnace department. The occupations of bottom fillers, clay men and barmen, dustmen, keepers' helpers, second and third, and cinder snappers, stockers, cinder men, larry men's helpers, scrap men, and stove cleaners, which together have more than 10,000 employees, include practically none but unskilled workmen, who have been trained to perform a fixed routine of duties closely connected with production and who are given special occupation names in the same way that street cleaners and stone breakers are specially designated, although they are nothing but unskilled laborers. The group which is called "laborers" in the present report includes only those who are generally known in the industry as "common laborers" and whose duties are usually not fixed, but are used to perform any necessary work and to take the places of any of the men in the other unskilled occupations if they

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are absent. This class, together with the employees in the unskilled occupations listed above, includes 15,949, or nearly two-thirds, of the 24,722 employees of the blast-furnace department. In addition, there are several occupations, such as iron handlers and loaders, in which the employees are unskilled, but who are paid a higher rate because of the severity of the work which they perform. Other occupations, such as ladle men and pig-machine men, include a large number of unskilled workmen, together with a small proportion of more highly skilled men, who could not be differentiated except on the basis of the rate, and such differentiation would obviously be an error.

In all, therefore, it may be said that the unskilled employees constitute more than two-thirds of the entire operating force of the blast furnaces. In all the districts but the Southern it may be said that practically all of these unskilled employees are recent immigrants, chiefly of the Slavic races, the majority of whom do not speak English. In the South the greater number are negroes, although an ever-increasing number of the recent immigrants are being utilized in the southern furnaces.

In view of the importance of this class of workmen in all departments of the industry, and particularly in connection with the blast furnaces, a more complete study of their wages in the blast-furnace department is presented in the following pages. The data in these tables relate only to the common unskilled laborers, who have been tabulated in the present report simply as laborers. Only adult employees, it should be noted, are included, particular care having been taken to eliminate all boys.

The next summary shows for each of the districts the number of plants reporting, normal number of employees, average earnings per hour, and number of employees earning each classified amount per hour. Time workers and tonnage workers are shown separately and the two classes are also combined.

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NUMBER OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS, BY DISTRICTS—BLAST FURNACES.

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Number of employees earning each classified amount per hour.										
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
TIME WORKERS.															
New England	5	308	$0.167	.....	5	140	97	48	6	2	10	.....	.....	.....	.....
Eastern	27	4,063	.149	55	1,189	1,991	612	136	55	19	6	.....	.....	.....	.....
Pittsburgh	47	9,266	.184	16	285	228	5,298	1,884	1,146	314	91	4	.....	.....	.....
Great Lakes and Middle West	34	6,114	.182	8	16	1,079	2,885	934	837	227	122	4	2	.....	.....
Southern	43	4,230	.138	1,299	1,536	741	288	137	158	54	13	4	.....	.....	.....
Total, all districts	156	23,981	.170	1,378	3,031	4,179	9,180	3,139	2,202	616	242	12	2	.....	.....
TONNAGE WORKERS.															
New England	2	20	.247	.....	.....	.....	.....	2	9	6	3	.....	.....	.....	.....
Eastern	9	169	.239	.....	.....	1	1	18	102	39	8	.....	.....	.....	.....
Pittsburgh	18	322	.255	.....	.....	8	52	46	98	47	57	14	.....	.....	.....
Great Lakes and Middle West	7	176	.220	.....	1	.....	24	25	96	14	16	.....	.....	.....	.....
Southern	9	54	.195	.....	.....	4	16	1	33	.....	.....	.....	.....	.....	.....
Total, all districts	45	741	.239	.....	1	13	93	92	338	106	84	14	.....	.....	.....
TIME AND TONNAGE WORKERS.															
New England	5	328	.172	.....	5	140	97	50	15	8	13	.....	.....	.....	.....
Eastern	27	4,232	.153	55	1,189	1,992	613	154	157	58	14	.....	.....	.....	.....
Pittsburgh	47	9,588	.186	16	285	236	5,350	1,930	1,244	361	148	18	.....	.....	.....
Great Lakes and Middle West	34	6,290	.183	8	17	1,079	2,909	959	933	241	138	4	2	.....	.....
Southern	43	4,284	.138	1,299	1,536	745	304	138	191	54	13	4	.....	.....	.....
Total, all districts	156	24,722	.172	1,378	3,032	4,192	9,273	3,231	2,540	722	326	26	2	.....	.....

The average hourly earnings for the 24,722 employees in 156 plants were 17.2 cents. The average earnings were lowest in the Southern district and highest in the Pittsburgh district.

The lowest rate reported was under 10 cents per hour, occurring in three districts, and the highest was 50 and under 60 cents, occurring in one district. Of the total number of employees 90.07 per cent earned between 12 and 25 cents per hour.

The hourly rate reported for the predominant number of employees in this department was 16 and under 18 cents, there being reported at this rate 9,273, or 37.51 per cent of all employees.

The district reporting the largest number of employees was the Pittsburgh district, which reported 38.78 per cent of all employees in this department. The average rate of earnings of these employees was 18.6 cents. It will be noted that while the rates in this district ranged from under 10 cents to 40 and under 50 cents per hour, 92.67 per cent earned between 16 and 30 cents per hour.

It will be noted that the number of employees reported at each classified amount per hour increased rapidly as the amounts increased until when the predominant amount is reached the number jumps in

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a marked degree, falling away more gradually as the amounts increased above the predominant amount.

The table which follows shows the per cent of employees earning each classified amount per hour. These percentages are computed from the third section of the table immediately preceding, in which time workers and tonnage workers are combined.

PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, AND AVERAGE HOURLY EARNINGS, BY DISTRICTS—BLAST FURNACES.

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
New England	5	328	$0.172	.....	1.52	42.68	29.57	15.24	4.57	2.44	3.96	.....	.....	.....	.....
Eastern	27	4,232	.153	1.30	28.10	47.07	14.48	3.64	3.71	1.37	.33	.....	.....	.....	.....
Pittsburgh	47	9,588	.186	.17	2.97	2.46	55.80	20.13	12.97	3.77	1.54	0.19	.....	.....	.....
Great Lakes and Middle West	34	6,290	.183	.13	.27	17.15	46.25	15.25	14.83	3.83	2.19	.06	0.03	.....	.....
Southern	43	4,284	.138	30.32	35.85	17.39	7.10	3.22	4.46	1.26	.30	.09	.....	.....	.....
Total, all districts	156	24,722	.172	5.57	12.26	16.96	37.51	13.07	10.27	2.92	1.32	.11	.01	.....	.....

Attention is directed to the fact that in this table are included such occupations as blowers and keepers, in which considerable skill is required. In the New England district 42.68 per cent of the employees earned 14 and under 16 cents per hour and 29.57 per cent 16 and under 18 cents. In the Eastern district 47.07 per cent earned 14 and under 16 cents and 28.10 per cent 12 and under 14 cents. In the Pittsburgh district 55.80 per cent earned 16 and under 18 cents and 20.13 per cent 18 and under 20 cents. In the Great Lakes and Middle West district 46.25 per cent earned 16 and under 18 cents and 17.15 per cent 14 and under 16 cents. In the Southern district 35.85 per cent earned 12 and under 14 cents and 30.32 per cent under 12 cents.

The summary in the form of cumulative percentages which follows shows that 34.79 per cent of all employees earned less than 16 cents per hour, and 72.30 per cent earned less than 18 cents per hour.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR—BLAST FURNACES.

Earnings per hour.	Number of employees.	Per cent of total number of employees.	Earnings per hour.	Number of employees.	Per cent of total number of employees.
Under 12 cents	1,378	5.57	Under 18 cents	17,875	72.30
Under 14 cents	4,410	17.83	Under 20 cents	21,106	85.37
Under 16 cents	8,602	34.79	Under 25 cents	23,646	95.64

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The per cent of employees earning less than certain specified amounts per hour is shown for each district in the table which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—BLAST FURNACES.

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.					
			Under 12 cents.	Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.
New England	328	$0.172	.....	1.52	44.20	73.77	89.01	93.58
Eastern	4,232	.153	1.30	29.40	76.47	90.95	94.59	98.30
Pittsburgh	9,588	.186	.17	3.14	5.60	61.40	81.53	94.50
Great Lakes and Middle West	6,290	.183	.13	.40	17.55	63.80	79.05	93.88
Southern	4,284	.138	30.32	66.17	83.56	90.66	93.88	98.34
Total, all districts	24,722	.172	5.57	17.83	34.79	72.30	85.37	95.64

The above comparison shows that the average earnings per hour were under 14 cents for 66.17 per cent of the 4,284 employees in the Southern district, 29.40 per cent of the 4,232 employees in the Eastern district, 3.14 per cent of the 9,588 employees in the Pittsburgh district, 1.52 per cent of the 328 employees in the New England district, and 0.40 per cent of the 6,290 employees in the Great Lakes and Middle West district. The average earnings per hour were under 18 cents for 90.95 per cent of the employees in the Eastern district, 90.66 per cent of the employees in the Southern district, 73.77 per cent of the employees in the New England district, 63.80 per cent of the employees in the Great Lakes and Middle West district, and 61.40 per cent of the employees in the Pittsburgh district. With reference to the above figures it may be said that in general those earning under 18 cents in the New England, Pittsburgh, and Great Lakes and Middle West districts and those earning less than 16 cents in the Eastern district and under 14 cents in the Southern district, together with a small proportion in the group earning 14 and under 16 cents, are unskilled workmen. A more detailed discussion of this class of employees is given in the pages which immediately follow.

WEEKLY EARNINGS OF UNSKILLED LABORERS.

Earnings are presented throughout this report on the hourly basis for the reason that comparisons are more readily made on this definite time basis. A few summaries showing earnings per week for unskilled laborers in blast furnaces are here submitted in order to determine the effect of working hours on earnings. These tables include only unskilled laborers and do not include stockers, cinder men, etc., who are likewise unskilled but are assigned to more specific work.

The first table shows the number and per cent of laborers earning each classified amount per week. The laborers are grouped according to customary hours worked per week.

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NUMBER AND PER CENT OF LABORERS EARNING EACH CLASSIFIED AMOUNT PER WEEK AND AVERAGE WEEKLY EARNINGS, BY HOURS OF LABOR PER WEEK—BLAST FURNACES.

Customary working hours per week.	Total laborers.	Average weekly earnings.	Number of laborers earning each classified amount per week.						Per cent of laborers earning each classified amount per week.					
			Under $8.	$8 and under $9.	$9 and under $10.	$10 and under $12.50	$12.50 and under $15.	$15 and over.	Under $8.	$8 and under $9.	$9 and under $10.	$10 and under $12.50	$12.50 and under $15.	$15 and over.
Under 60	44	$8.11	16	23	5	.....	.....	.....	36.36	52.27	11.36	.....	.....	.....
60	1,062	9.17	132	225	483	222	.....	.....	12.43	21.19	45.48	20.90	.....	.....
Over 60 and under 70	277	10.01	7	81	72	117	.....	.....	2.53	29.24	25.99	42.24	.....	.....
70	2,227	10.75	79	243	264	1,637	4	.....	3.55	10.91	11.85	73.51	0.18	.....
72 and under 84	656	11.67	34	.....	55	422	145	.....	5.18	.....	8.38	64.33	22.10	.....
84 and over	1,523	13.11	26	120	44	312	1,018	3	1.71	7.88	2.89	20.49	66.84	0.20
Total	5,789	11.13	294	692	923	2,710	1,167	3	5.08	11.95	15.94	46.81	20.16	.05

The above table demonstrates clearly the fact that with the increase in the length of the working week there is not only a rise in the average weekly earnings, but also a very gradual increase in the average hourly earnings. For example, for the employees working 60 hours the average hourly earnings are 15.25 cents; for 70 hours, 15.35 cents; and for 84 hours (those working more than 84 are negligible), 15.6 cents. This is true in spite of the fact that it is known in a number of establishments that the employees working the shorter number of hours are compensated by receiving an hourly rate sufficiently higher almost to make their weekly earnings equal to those working the long hours.

In the table which follows are shown the earnings of laborers per full week in the different districts. The Great Lakes and Middle West district, it will be noted, had a little higher average than the Pittsburgh district, and both these were very much higher than either of the other districts.

NUMBER AND PER CENT OF LABORERS EARNING EACH CLASSIFIED AMOUNT PER WEEK AND AVERAGE WEEKLY EARNINGS, BY DISTRICTS—BLAST FURNACES.

Districts.	Total laborers.	Average weekly earnings.	Number of laborers earning each classified amount per week.						Per cent of laborers earning each classified amount per week.					
			Under $8.	$8 and under $9.	$9 and under $10.	$10 and under $12.50	$12.50 and under $15.	$15 and over.	Under $8.	$8 and under $9.	$9 and under $10.	$10 and under $12.50	$12.50 and under $15.	$15 and over.
New England	123	$10.55	.....	29	8	82	4	.....	.....	23.58	6.50	66.67	3.25	.....
Eastern	1,060	9.87	119	262	219	443	17	.....	11.23	24.72	20.66	41.79	1.60	.....
Pittsburgh	2,100	11.75	1	.....	378	1,221	497	3	.05	.....	18.00	58.14	23.67	0.14
Great Lakes and Middle West	1,628	11.95	.....	.....	169	828	631	.....	.....	.....	10.38	50.86	38.76	.....
Southern	878	9.72	174	401	149	136	18	.....	19.82	45.67	16.97	15.49	2.05	.....
Total, all districts	5,789	11.13	294	692	923	2,710	1,167	3	5.08	11.95	15.94	46.81	20.16	.05

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From the above table it will be seen that the average weekly earnings of the 5,789 laborers in blast furnaces were $11.13, ranging from less than $8 to $15. Only in the Pittsburgh and the Great Lakes and Middle West districts, however, did any considerable proportion earn as much as $12.50. Those earning less than $8 per week were all in the Southern and Eastern districts with the exception of one employee.

Considering all districts as a whole, 79.78 per cent earned less than $12.50 per week when working full time. In the Eastern district 56.61 per cent and in the Southern district 82.46 per cent earned less than $10 per week. In the Southern district 19.82 per cent and in the Eastern district 11.23 per cent earned less than $8 per week when working the full number of hours. There is, however, a direct connection between the number of hours worked per week and the total weekly earnings.

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working hours per week for each occupation and in each plant are presented in detail in Table I, Volume II, of this report. These data are summarized in the text tables which follow. The first of these tables shows for each occupation the number of plants reporting, the normal number of employees, the average customary working hours per week, and the number of employees whose customary working time was each specified number of hours per week.

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NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK—BLAST FURNACES.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Blowers	130	354	83.7	.....	.....	.....	.....	5	2	5	341	1
Blowing engineers	155	452	83.9	.....	.....	.....	.....	1	.....	6	445	.....
Blowing engineers' assistant	49	212	83.6	.....	.....	.....	.....	3	2	4	203	.....
Bottom fillers	123	3,197	83.8	.....	.....	.....	.....	.....	.....	80	3,117	.....
Cagers	48	152	83.9	.....	.....	.....	.....	.....	.....	2	150	.....
Car-dumper operators	11	18	79.1	.....	.....	.....	.....	2	5	.....	11	.....
Cinder men	103	786	81.3	.....	.....	2	44	69	.....	10	659	2
Clay men and barmen	68	185	78.3	.....	.....	.....	3	61	.....	16	105	.....
Cranemen	54	241	81.0	.....	.....	4	10	19	6	6	196	.....
Dustmen	32	111	79.0	.....	.....	.....	2	33	2	3	71	.....
Engineers, stationary	58	256	83.0	.....	.....	.....	.....	9	6	11	230	.....
Gas washers	10	42	83.1	.....	.....	.....	.....	1	2	.....	39	.....
Iron breakers	34	200	76.8	.....	2	11	.....	73	.....	4	110	.....
Iron graders	18	69	72.0	.....	.....	1	.....	57	.....	.....	11	.....
Iron handlers and loaders	105	1,349	77.2	.....	12	40	77	394	.....	35	791	.....
Keepers	156	568	83.9	.....	.....	.....	.....	1	.....	6	561	.....
Keepers' helpers, first	99	484	84.0	.....	.....	.....	.....	.....	.....	2	482	.....
Keepers' helpers, second	98	781	83.9	.....	.....	.....	.....	.....	.....	8	773	.....
Keepers' helpers, third, and cinder snappers	84	631	84.0	.....	.....	.....	.....	.....	.....	4	627	.....
Keepers' helpers, not specified	56	485	83.8	.....	.....	.....	.....	.....	.....	16	469	.....
Laborers	148	5,789	72.6	2	5	37	1,062	2,504	117	530	1,504	19
Ladle men	58	[1] 412	82.7	1	.....	.....	7	13	10	6	375	.....
Larry men	48	376	84.0	.....	.....	.....	.....	.....	1	.....	375	.....
Larry men's helpers	26	288	84.0	.....	.....	.....	.....	.....	.....	.....	288	.....
Ore-bridge operators	29	127	79.4	.....	.....	6	.....	12	13	14	82	.....
Pig-machine men	42	[2] 561	84.0	.....	.....	.....	.....	1	.....	2	558	.....
Scrap men	78	405	81.8	.....	1	.....	5	33	.....	40	326	.....
Skip operators	44	203	84.0	.....	.....	.....	.....	.....	.....	.....	203	.....
Stockers	125	[3] 3,608	75.8	.....	1	23	371	1,217	108	198	1,690	.....
Stove cleaners	40	164	77.6	.....	.....	.....	15	43	.....	11	95	.....
Stove tenders	136	517	83.9	.....	.....	.....	.....	.....	.....	6	511	.....
Top fillers	96	626	81.6	.....	.....	51	.....	.....	.....	8	567	.....
Transfer-car operators	19	59	79.9	.....	.....	.....	.....	11	6	2	40	.....
Tuyere men	28	113	82.2	.....	.....	.....	.....	7	4	14	87	1
Unclassified	108	868	75.5	7	8	34	98	215	24	28	453	1
Total, all occupations	156	[4] 24,689	78.9	10	29	209	1,694	4,784	308	1,086	16,545	24

[1] Not including 2 employees who worked 2 days only at this occupation.
[2] Not including 25 employees who worked 2 days only and 2 employees who worked 3 days only at this occupation.
[3] Not including 4 employees who worked 2 days only at this occupation.
[4] Not including 31 employees who worked 2 days only and 2 employees who worked 3 days only.

The average customary working time per week for the total number of employees was 78.9 hours. Of the 24,689 employees included in the above table 67.11 per cent worked 84 hours or more per week.

The table which follows shows for each of the principal occupations the per cent of employees working each classified number of hours.

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PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK—BLAST FURNACES.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Stockers	125	[1] 3,608	75.8	.....	0.03	0.64	10.28	33.73	2.99	5.49	46.84	.....
Bottom fillers	123	3,197	83.8	.....	.....	.....	.....	.....	.....	2.50	97.50	.....
Top fillers	96	626	81.6	.....	.....	8.15	.....	.....	.....	1.28	90.58	.....
Blowing engineers	155	452	83.9	.....	.....	.....	.....	.22	.....	1.33	98.45	.....
Stove tenders	136	517	83.9	.....	.....	.....	.....	.....	.....	1.16	98.84	.....
Blowers	130	354	83.7	.....	.....	.....	.....	1.41	.56	1.41	96.33	0.28
Keepers	156	568	83.9	.....	.....	.....	.....	.18	.....	1.06	98.77	.....
Keepers' helpers	155	2,381	83.9	.....	.....	.....	.....	.....	.....	1.26	98.74	.....
Iron handlers and loaders	105	1,349	77.2	.....	.89	2.97	5.71	29.21	.....	2.59	58.64	.....
Cinder men	103	786	81.3	.....	.....	.25	5.60	8.78	.....	1.27	83.84	.25
Laborers	148	5,789	72.6	.03	.09	.64	18.35	43.25	2.02	9.31	25.96	.33
Other occupations[2]	.....	5,062	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total, all occupations	156	[3]24,689	78.9	.04	.12	.85	6.86	19.38	1.25	4.40	67.01	.10

[1] Not including 4 employees who worked 2 days only at this occupation.
[2] Details not separately reported.
[3] Not including 31 employees who worked 2 days only and 2 employees who worked 3 days only.

The table which follows shows for each of the principal occupations included in the preceding table the per cent of employees customarily working 72 hours and over per week and the per cent working 84 hours and over.

PER CENT OF EMPLOYEES IN THE PRINCIPAL OCCUPATIONS CUSTOMARILY WORKING 72 HOURS AND OVER PER WEEK—BLAST FURNACES.

Occupations.	Normal number of employees.	Per cent of employees whose customary working hours per week were—	
		72 and over.	84 and over.
Stockers	[1] 3,608	55.32	46.84
Bottom fillers	3,197	100.00	97.50
Top fillers	626	91.86	90.58
Blowing engineers	452	99.78	98.45
Stove tenders	517	100.00	98.84
Blowers	354	98.58	96.61
Keepers	568	99.83	98.77
Keepers' helpers	2,381	100.00	98.74
Iron handlers and loaders	1,349	61.23	58.64
Cinder men	786	85.36	84.09
Laborers	5,789	37.64	26.31
Other occupations [2]	5,062	.....	.....
Total, all occupations	[3]24,689	72.76	67.11

[1] Not including 4 employees who worked 2 days only at this occupation.
[2] Details not separately reported.
[3] Not including 31 employees who worked 2 days only and 2 employees who worked 3 days only.

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The customary working hours per week were 84 hours and over for more than 90 per cent of the employees in each of the following principal occupations:

	Per cent.
Stove tenders	98.84
Keepers	98.77
Keepers' helpers	98.74
Blowing engineers	98.45
Bottom fillers	97.50
Blowers	96.61
Top fillers	90.58

The customary working time per week was less than 60 hours per week for only a very small per cent of employees in the principal occupations. Of the top fillers, 51, or 8.15 per cent of the total number, worked 56 hours and under 60 hours per week, the employees in this occupation in three of the plants being on three shifts of 8 hours each instead of two shifts of 12 hours each. Iron handlers and loaders is the only other occupation in which as many as 1 per cent of the employees work less than 60 hours per week. The percentage in that occupation is 3.86.

The next table is a summary showing customary working hours per week, comparing the five districts. Time workers and tonnage workers are shown separately.

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NUMBER OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK, BY DISTRICTS—BLAST FURNACES.

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
TIME WORKERS.												
New England	5	308	76.9	.....	5	6	3	114	.....	4	176	.....
Eastern	27	4,063	78.6	2	4	61	393	664	57	244	2,637	1
Pittsburgh	47	[1] 9,233	78.6	7	2	56	772	1,720	144	637	5,874	21
Great Lakes and Middle West	34	6,114	79.5	.....	3	40	337	1,173	60	136	4,363	2
Southern	43	4,230	79.4	1	2	25	169	971	47	45	2,970	.....
Total, all districts	156	[1] 23,948	78.9	10	16	188	1,674	4,642	308	1,066	16,020	24
TONNAGE.												
New England	2	20	76.2	.....	.....	3	3	.....	.....	.....	14	.....
Eastern	9	169	75.6	.....	11	2	4	59	.....	.....	93	.....
Pittsburgh	18	322	81.3	.....	2	16	5	7	.....	20	272	.....
Great Lakes and Middle West	7	176	79.0	.....	.....	.....	2	60	.....	.....	114	.....
Southern	9	54	76.8	.....	.....	.....	6	16	.....	.....	32	.....
Total, all districts	45	741	78.9	.....	13	21	20	142	.....	20	525	.....
TIME AND TONNAGE WORKERS.												
New England	5	328	76.9	.....	5	9	6	114	.....	4	190	.....
Eastern	27	4,232	78.4	2	15	63	397	723	57	244	2,730	1
Pittsburgh	47	[1] 9,555	78.7	7	4	72	777	1,727	144	657	6,146	21
Great Lakes and Middle West	34	6,290	79.4	.....	3	40	339	1,233	60	136	4,477	2
Southern	43	4,284	79.4	1	2	25	175	987	47	45	3,002	.....
Total, all districts	156	[1] 24,689	78.9	10	29	209	1,694	4,784	308	1,086	16,545	24

[1] Not including 31 employees who worked 2 days only and 2 employees who worked 3 days only.

The customary working time was 84 hours and over per week for 67 per cent of the 23,948 time workers and for 70.9 per cent of the 741 tonnage workers. The average hours were 78.9 per week for both time workers and tonnage workers.

The table which follows shows for time workers and tonnage workers combined the per cent of employees whose customary working time per week was each classified number of hours. The totals for the five districts are placed in comparison.

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PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK, BY DISTRICTS—BLAST FURNACES.

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	5	328	76.9	.....	1.52	2.74	1.83	34.76	.....	1.22	57.93	.....
Eastern	27	4,232	78.4	0.05	.35	1.49	9.38	17.08	1.35	5.77	64.51	0.02
Pittsburgh	47	[1] 9,555	78.7	.07	.04	.75	8.13	18.07	1.51	6.88	64.32	.22
Great Lakes and Middle West	34	6,290	79.4	.....	.05	.64	5.39	19.60	.95	2.16	71.18	.03
Southern	43	4,284	79.4	.02	.05	.58	4.08	23.04	1.10	1.05	70.07	.....
Total, all districts.	156	[1] 24,689	78.9	.04	.12	.85	6.86	19.38	1.25	4.40	67.01	.10

[1] Not including 31 employees who worked 2 days only and 2 employees who worked 3 days only.

The proportion of employees whose customary working time per week was 84 hours and over is approximately the same in the Great Lakes and Middle West district and in the Southern district, the percentages being 71.21 and 70.07, respectively. The proportion is somewhat lower in the Pittsburgh district and in the Eastern district, the percentages in those two districts being 64.54 and 64.53, respectively, and considerably lower in the New England district, where the percentage is 57.93; only 328 employees are included, however, in the New England district.

The customary working time was 72 hours per week or over for 74.32 per cent of the 6,290 employees in the Great Lakes and Middle West district, for 72.93 per cent of the 9,555 employees in the Pittsburgh district, for 72.22 per cent of the 4,284 employees in the Southern district, for 71.65 per cent of the 4,232 employees in the Eastern district, and for 59.15 per cent of the 328 employees in the New England district.

DAYS WORKED PER WEEK.

Under each occupation the customary working days or turns per week for each plant are shown in Table I, Volume II of this report. These data are briefly summarized here. The table which follows shows for each occupation the number of plants reporting, the normal number of employees, and the number of employees whose customary working time was each specified number of days or turns per week.

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NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH SPECIFIED NUMBER OF DAYS PER WEEK—BLAST FURNACES.

Occupations.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Blowers	130	354	.....	.....	2	.....	352
Blowing engineers	155	452	.....	.....	.....	.....	452
Blowing engineers, assistant	49	212	.....	.....	2	.....	210
Bottom fillers	123	3,197	.....	.....	.....	.....	3,197
Cagers	48	152	.....	.....	.....	.....	152
Car-dumper operators	11	18	.....	.....	5	.....	13
Cinder men	103	786	.....	.....	44	.....	742
Clay men and barmen	68	185	.....	.....	3	.....	182
Cranemen	54	241	.....	.....	17	.....	224
Dustmen	32	111	.....	.....	4	.....	107
Engineers, stationary	58	256	.....	.....	7	5	244
Gas washers	10	42	.....	.....	2	.....	40
Iron breakers	34	200	.....	.....	.....	.....	200
Iron graders	18	69	.....	.....	.....	.....	69
Iron handlers and loaders	105	1,349	1	.....	84	.....	1,264
Keepers	156	568	.....	.....	.....	.....	568
Keepers' helpers, first	99	484	.....	.....	.....	.....	484
Keepers' helpers, second	98	781	.....	.....	.....	.....	781
Keepers' helpers, third, and cinder snappers	84	631	.....	.....	.....	.....	631
Keepers' helpers, not specified	56	485	.....	.....	.....	.....	485
Laborers	148	5,789	.....	.....	1,236	.....	4,553
Ladle men	58	[1] 412	.....	.....	17	.....	395
Larry men	48	376	.....	.....	1	.....	375
Larry men's helpers	26	288	.....	.....	.....	.....	288
Ore-bridge operators	29	127	.....	.....	20	2	105
Pig-machine men	42	[2] 561	.....	.....	.....	.....	561
Scrap men	78	405	1	.....	5	.....	399
Skip operators	44	203	.....	.....	.....	.....	203
Stockers	125	[3] 3,608	10	.....	504	.....	3,094
Stove cleaners	40	164	.....	.....	15	.....	149
Stove tenders	136	517	.....	.....	.....	.....	517
Top fillers	96	626	.....	.....	.....	.....	626
Transfer-car operators	19	59	.....	.....	6	.....	53
Tuyere men	28	113	.....	.....	4	.....	109
Unclassified	108	868	3	.....	158	.....	707
Total, all occupations	156	[4] 24,689	15	.....	2,136	7	22,531

[1] Not including 2 employees who worked 2 days only at this occupation.
[2] Not including 25 employees who worked 2 days only and 2 employees who worked 3 days only at this occupation.
[3] Not including 4 employees who worked 2 days only at this occupation.
[4] Not including 31 employees who worked 2 days only and 2 employees who worked 3 days only.

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The table which follows shows for each of the principal occupations the proportion of employees whose customary working days or turns were 5, 6, and 7:

PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH SPECIFIED NUMBER OF DAYS PER WEEK—BLAST FURNACES.

Occupations.	Number of plants.	Normal number of employees.	Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Stockers	125	[1] 3,608	0.28	.....	13.97	.....	85.75
Bottom fillers	123	3,197	.....	.....	.....	.....	100.00
Top fillers	96	626	.....	.....	.....	.....	100.00
Blowing engineers	155	452	.....	.....	.....	.....	100.00
Stove tenders	136	517	.....	.....	.....	.....	100.00
Blowers	130	354	.....	.....	.56	.....	99.44
Keepers	156	568	.....	.....	.....	.....	100.00
Keepers' helpers	155	2,381	.....	.....	.....	.....	100.00
Iron handlers and loaders	105	1,349	.07	.....	6.23	.....	93.70
Cinder men	103	786	.....	.....	5.60	.....	94.40
Laborers	148	5,789	.....	.....	21.35	.....	78.65
Other occupations [2]	.....	5,062	.....	.....	.....	.....	.....
Total, all occupations	156	[3] 24,689	.06	.....	8.65	0.03	91.26

[1] Not including 4 employees who worked 2 days only at this occupation.
[2] Details not separately reported.
[3] Not including 31 employees who worked 2 days only and 2 employees who worked 3 days only.

The table which follows compares the totals for each of the five districts as far as customary days worked per week are concerned:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF DAYS PER WEEK, BY DISTRICTS—BLAST FURNACES.

Districts.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	5	328	.....	.....	11	.....	317	.....	.....	3.35	.....	96.65
Eastern	27	4,232	4	.....	531	.....	3,697	0.09	.....	12.55	.....	87.36
Pittsburgh	47	[1] 9,555	10	.....	943	7	8,595	.10	.....	9.87	0.07	89.95
Great Lakes and Middle West	34	6,290	.....	.....	423	.....	5,867	.....	.....	6.72	.....	93.28
Southern	43	4,284	1	.....	228	.....	4,055	.02	.....	5.32	.....	94.65
Total, all districts	156	[1] 24,689	15	.....	2,136	7	22,531	.06	.....	8.65	.03	91.26

[1] Not including 31 employees who worked 2 days only and 2 employees who worked 3 days only.

Seven days or turns per week was the customary working time for 22,531 employees or 91.26 per cent of the total; six days or turns per week was the customary working time for 2,136 employees, or 8.65 per cent of the total; and five days or turns per week was the customary working time for only 15 employees, or 0.06 per cent of the total.

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The proportion customarily working seven days or turns per week varied from 96.65 per cent in the New England district to 87.36 per cent in the Eastern district.

BESSEMER CONVERTERS.

INTRODUCTION.

The data embraced in this section present full information as to earnings and hours of labor for 24 of the 25 standard Bessemer converter plants which were in operation during the month of May, 1910. Only one plant was not operated during that period, and none has been constructed since that time. The information, therefore, completely covers the conditions of labor as regards earnings and hours for the Bessemer plants of the country. The data relative to earnings and hours of work are summarized briefly in the pages immediately following. This summary is then followed by a description of the equipment and method of operation and the occupations of a typical Bessemer converter plant and an analysis somewhat more in detail of the earnings and hours of labor by districts and by individual occupations.

SUMMARY OF EARNINGS AND HOURS AND DAYS OF WORK.

EARNINGS.

Data relative to earnings were reported for 4,927 employees in special iron and steel occupations in 24 Bessemer converter plants. Of the employees 57.28 per cent were in the Pittsburgh district, and 85.59 per cent were in the Pittsburgh district and in the Great Lakes and Middle West district combined. For this reason the employees in the other districts are not reported separately, although they are included in the totals for all districts.

Of the total of 4,927 employees, 33.18 per cent earned 16 and under 18 cents per hour; the second largest group, 14.19 per cent, earned 20 and under 25 cents per hour; and the third largest group, 13.31 per cent, earned 14 and under 16 cents per hour. There were 14.41 per cent who earned under 16 cents, and 4.97 per cent earned 50 cents and over. The average earnings per hour for all employees in both skilled and unskilled occupations were 23.2 cents. In the Great Lakes and Middle West district the average earnings were slightly lower than in the Pittsburgh district.

The distribution of earnings in the principal districts and in all districts is shown in the table which follows. Only the two principal districts are shown in this table, as the number in the other district is too small for comparison.

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PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY PRINCIPAL DISTRICTS—BESSEMER CONVERTERS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour—							
			Under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 cents and over.
Pittsburgh	2,822	$0.241	4.82	37.77	9.99	11.09	11.06	12.65	7.51	5.10
Great Lakes and Middle West.	1,395	.226	14.48	37.49	10.75	17.71	5.73	4.23	2.51	7.10
Total, all districts	4,927	.232	14.41	33.18	9.78	14.19	8.79	9.36	5.32	4.97

The summary in the form of cumulative percentages which follows shows that 14.41 per cent of all employees earned less than 16 cents per hour; 47.59 per cent earned less than 18 cents per hour, and 71.56 per cent earned less than 25 cents per hour. The fact that only 28.44 per cent of the employees earn as much as 25 cents per hour takes on added significance when we consider that the work in this department is in large part continuous and strenuous, and that much of it is carried on under conditions of extreme heat and serious exposure to injury.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY PRINCIPAL DISTRICTS—BESSEMER CONVERTERS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning per hour—						
			Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
Pittsburgh	2,822	$0.241	4.82	42.59	52.58	63.67	74.73	87.38	94.89
Great Lakes and Middle West.	1,395	.226	14.48	51.97	62.72	80.43	86.16	90.39	94.62
Total, all districts	4,927	.232	14.41	47.59	57.37	71.56	80.35	89.71	95.03

As 85.59 per cent of the employees were in the Pittsburgh district and the Great Lakes and Middle West district the other districts are omitted from this discussion. The earnings for these two districts were very similarly distributed, the earnings for the Great Lakes and Middle West being a little lower in all the groups, the final difference in the average of 1.5 cents per hour, however, being largely influenced by the 14.48 per cent receiving less than 16 cents per hour in the Great Lakes and Middle West district. The earnings were under 18 cents per hour for 51.97 per cent of the 1,395 employees in the Great Lakes and Middle West district, and for 42.59 per cent of the 2,822 employees in the Pittsburgh district. The

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earnings were under 25 cents per hour for 80.43 per cent of the employees in the Great Lakes and Middle West district, and for 63.67 per cent of the employees in the Pittsburgh district.

HOURS OF LABOR.

The customary working hours per week were reported for 4,927 employees in special iron and steel occupations in 24 Bessemer converting plants. Seventy-two hours per week was the customary working time for 37.10 per cent of all employees; 19.69 per cent customarily worked 60 and under 72 hours; and 16.03 per cent worked 84 hours per week. Of the employees engaged in the actual producing occupations in this department 62.90 per cent had a working day of 12 hours or over; and for the 16.03 per cent who worked 84 hours per week a 12-hour day for the entire 7 days a week is indicated. The 84-hour week is further discussed under the heading "Days per week." The hours most generally worked were 72 in both the Pittsburgh and the Great Lakes and Middle West districts. The classified customary working hours per week for the principal districts and for the total of all districts are shown in the following table:

PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY PRINCIPAL DISTRICTS—BESSEMER CONVERTERS

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—							
			48 and under.	Over 48 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Pittsburgh	2,822	68.2	18.46	5.95	2.94	11.80	31.86	13.64	13.39	1.95
Great Lakes and Middle West.	1,395	73.5	6.45	.22	.65	2.58	61.43	2.94	25.73	.....
Total, all districts	4,927	69.5	12.40	5.01	1.91	17.78	37.10	8.65	16.03	1.12

A large proportion of the employees are in the Pittsburgh and the Great Lakes and Middle West districts. The average hours per week were considerably higher in the Great Lakes and Middle West district than in the Pittsburgh district. In the Pittsburgh district 39.15 per cent of the employees worked less than 72 hours per week, and in the Great Lakes and Middle West district only 9.90 per cent worked less than 72 hours per week. Eighty-four hours and over was the customary working time for 25.73 per cent of the employees in the Great Lakes and Middle West district and for 15.34 per cent of the employees in the Pittsburgh district.

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DAYS PER WEEK.

The week of 6 days or turns was the customary working time for 65.72 per cent of the total number of employees in the special iron and steel occupations in the Bessemer converting plants. Seven days or turns per week were customary for 23.44 per cent of all employees; 5 and 6 days or turns, alternately, for 8.04 per cent of all employees; 6 and 7 days or turns, alternately, for 2.80 per cent; and 5, 6, and 7 days or turns in rotation for 1.58 per cent of all employees.

Of the 23.44 per cent of employees who worked 7 days or turns, 73.16 per cent of them (or 17.15 per cent of all employees) worked, in effect, a 12-hour shift for the entire 7 days of the week. It is important in considering the figures showing the percentage of employees in this department working 7 days of the week to remember that the occupations here reported do not include employees working on repairs, whose services may therefore be required when the converters are not in operation; the operations here covered include only those directly connected with productive processes. It can not be claimed that there is any metallurgical necessity requiring the Bessemer processes to be carried on continuously; the number of employees who necessarily remain at work when the actual converting processes are stopped is a very small percentage of the total employees; and the per cent shown as working 84 hours a week is due to the fact that some Bessemer plants, at the time of this investigation, were being operated continuously for 7 days each week.

In several of the principal occupations a considerable proportion of the employees customarily worked 7 days or turns per week. Seven days or turns per week were customarily worked by 48.95 per cent of the cupola chargers, 40.54 per cent of the laborers, 22.92 per cent of the blowing engineers, 22.19 per cent of the cinder men, 16.13 per cent of the vessel scrappers, 15.32 per cent of the cupola tappers, and 12.05 per cent of the stockers.[1]

GENERAL DESCRIPTION OF EQUIPMENT AND METHOD OF OPERATION.

A description of the technical processes in this department is not essential to this report except in so far as necessary to indicate the character of the employment or the condition under which the work of the different occupations is carried on. The technical processes will be here discussed, therefore, only to the extent that is necessary to make clear later descriptions of occupations or conditions of work.

The Bessemer process, invented by Sir Henry Bessemer in 1855, was the first method devised for the economical production of steel in large quantities, and until the last few years was the method by

[1] For tables showing days worked per week, see pp. 77-79.

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which the greatest part of the world's steel was produced. The process consists essentially in blowing air through molten pig iron contained in a suitable vessel, whereby the impurities are oxidized and removed, and the product is obtained in a fluid condition. Depending upon the nature of the lining of the vessel there are two modifications, (*a*) acid Bessemer process (the original process, hence also called simply the Bessemer process); and (*b*) basic Bessemer process, in which there is elimination of nearly all the silicon, carbon, and manganese, as in the acid process, and in addition most of the phosphorus and part of the sulphur. In America all the converters of any size, and all converters contained in this report, have acid linings, and hence in this outline no attention will be paid to the basic process.

The equipment of the typical converter plant consists of (1) a "mixer," a large vessel usually of 200 to 500 tons capacity in which the molten iron brought from the blast furnace is mixed and held at a working temperature until needed. The "mixer" may be briefly described as a large vessel formed of steel plates lined with fire brick and mounted upon rockers or trunnions so that it can be tilted, when receiving or pouring the metal, by a suitable massive hydraulic mechanism; (2) cupolas, which are essentially miniature blast furnaces, in which cold pig iron can be melted down to supply the converters; (3) two, three, or four converters (vessels) in which the process proper is carried out; (4) means for handling the molds into which the molten steel is cast from ladles to form ingots. Without exception in the Bessemer plants of this country the ingots are cast in molds mounted upon small narrow-gauge trucks, which run on tracks before the casting platform. (5) There are also engines for supplying the blast (blowing or blast engines), as well as cranes and special ladles for handling the molten metals; and (6) a proper platform from which the man in charge (blower) and his assistants can view the entire plant and provided with proper mechanism for controlling the vessels, ladles, etc.

The vessel or converter is usually pear-shaped or egg-shaped, the bottom of which is perforated with a large number of holes through which a powerful blast of air enters and passes through the bath of metal, thereby oxidizing the impurities, which, if solid, go into the slag, or, if gaseous, escape through the mouth of the converter. The converter, which has a very thick lining of extremely refractory material, is mounted at about the middle on trunnions set in a massive casting and is provided with a hydraulic mechanism by which it can be tilted to various angles. The vessel proper consists of a steel shell suitably lined, and comprises three sections: The bottom, the middle part or body (belly), and the upper part or nose, which is open at the top or mouth. The blast, at a pressure of

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about 20 to 25 pounds to the square inch, which is carried by a main through one of the trunnions made hollow for the purpose, is admitted at the bottom through "tuyeres" or holes formed in bricks of a special design, called "tuyere bricks" (each of which contains a number of holes), around which is rammed refractory material (bottom stuff), the whole being held in a suitable casting. As the lining of the bottom wears away much more rapidly than that of the vessel proper, the bottom is arranged so that it can be removed entirely or in part and replaced by a fresh one. The bottom is closed by an iron plate (bottom plate), between which and the bottom of the tuyeres is an open space (wind box, blast box, or tuyere box) into which the blast is admitted. For acid vessels the body and nose sections are lined with blocks or pieces of ganister or firestone set in "ball stuff" (an extremely refractory mixture of ground ganister or quartz and sand with a little clay to make the mass plastic). The bottoms and the lining must be dried very carefully before use. In acid practice the bottoms last about 23 to 25 (occasionally 30) heats and the vessel linings up to 5,000 or 6,000 or more. While the vessel is in service it is patched between heats, and more thoroughly on Saturday nights and Sundays, by throwing on the worn spots ball stuff or vessel patching, and at the same time any accretions (kidneys) are pried off. If one of the tuyeres burns through, the vessel may be turned down while the charge is still in it and the defective tuyere either cut out and a fresh one put in its place, a dummy tuyere (without any holes in it) inserted, or it may be "noodled," i. e., strips (noodles or rat-tails) of ball stuff are forced into the holes and an iron plate clamped on over the bottom.

The process is as follows: A ladle containing the proper charge of molten iron drawn from the mixer or the cupolas is brought on a track directly opposite the converter. The converter is then turned down on its side and the molten metal poured into it from the ladle. Owing to the size and design of the converter, the metal when the converter is in this position lies in the upper part of the belly well above the tuyeres, which would be filled with iron if the blast were not on. The blast is then turned on and the vessel turned up; that is, rotated to a vertical position. The blast now pours through the 18 inches or more of molten metal in the bottom of the converter in a wide spray of tiny bubbles and rapidly oxidizes the impurities. The changes taking place are indicated by the character of the flame. At first it is very short and dull, only the silicon and part of the manganese burning; after the silicon is gone the carbon is attacked, and the flame grows longer and very brilliant. This latter period is sometimes called the boil on account of the copious evolution of carbonic oxide gas which violently stirs up the charge. As the flame

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is very trying to the eyes, special dark-colored glasses (blowers' glasses) are employed to observe it. When the carbon is practically all gone the flame drops, which is an indication that the process is finished. The heat necessary is derived principally from the combustion of the silicon and carbon. If the pig iron employed contains too high a percentage of silicon, too much heat will be generated and the charge is said to "blow hot." In this case it is necessary to cool the bath by blowing in a little steam with the blast, or better by throwing in steel scrap (scrapping). If, on the other hand, the iron contains too low a percentage of silicon, the reverse action results and the charge is said to "blow cold."

When the metal is fully blown, which in America takes from 8 to 20 minutes, the vessel is turned down and its contents (from 8 to 20 tons of molton steel) is poured into a ladle, usually mounted on a large jib crane. Since the metal now contains so little carbon that it would be useless for commercial purposes, a carefully weighed amount of iron high in manganese is added, which carries with it the necessary carbon and also acts as a deoxidizer. This may be added in either solid or molten form. The crane carrying the ladle is then swung around in a semicircle to the pouring platform, where it is taken in hand by the steel pourer and his helpers and the metal is cast into ingot molds, as described in connection with these occupations.

After the metal has sufficiently cooled and solidified, the mold is removed from the ingot by a special type of crane known as the "ingot stripper," which is described in connection with the occupation, and is ready, though still red-hot, to be taken to the blooming mill for shaping.

In a few cases part or all of the Bessemer material after being partially blown is carried while still molten to the open-hearth department (duplex process). In this case of course the casting crew is not needed.

DESCRIPTION OF OCCUPATIONS.

In the following description of occupations the main occupation name shown represents the term retained in the report under which data as to wages and hours of labor are presented. The names shown in parenthesis represent the most important minor occupations included under the name used in this report as well as other terms used in various establishments to indicate the same class of work. In the first paragraph, "Duties," is given a description of the functions which employees in the occupation perform and the method by which the work is done. In the second paragraph, "Nature of work," two points are covered, first, an indication of the

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type of workman required for the position, and, second, the conditions under which the work is done. The order in which the occupations are given follows that of the processes of manufacture.

STOCKERS.

(Including Stock Unloaders; Barrow Men; Stock Laborers.)

DUTIES.—Unload and handle materials, pig iron, spiegel, and scrap until it is delivered at the cupolas.

NATURE OF WORK.—Generally requires unskilled workmen, but the work varies in difficulty. (See stockers, open-hearth department.)

BLOWING ENGINEERS.

(Including First Engineers.)

DUTIES.—In charge of and operate engines which furnish the blast for the converter and the cupolas.

NATURE OF WORK.—The work is of lower grade though of the same general nature as that of the blowing engineers in the blast-furnace department.

CUPOLA HOIST MEN.

DUTIES.—Operate the hoist upon which materials are raised from the ground level to the charging level of the cupolas.

NATURE OF WORK.—Practically unskilled workmen required. Comparable with the work of freight-elevator operators. The work is frequently done by boys or common laborers, but is shown here in order to hold the entire cupola crew together.

CUPOLA CHARGERS.

(Including Top Men; Top Chargers.)

DUTIES.—Wheel materials in barrows from the hoist and dump them into the cupola. This work is displaced in some plants by the use of a charging machine, similar in general plan to the open-hearth charging machine.

NATURE OF WORK.—This is hard, hot work; in many ways analogous to the work of top fillers at the blast furnace, a cupola resembling in general plan a miniature blast furnace.

CUPOLA MELTERS.

(Including Cupola Foremen.)

DUTIES.—Regulate the blast, direct the tapping of cupolas, and have general charge of the cupola division.

NATURE OF WORK.—Considerable practical knowledge of metallurgy is required, and the position is one of much responsibility.

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CUPOLA TAPPERS.

(Including Iron Tappers; Cinder Tappers.)

DUTIES.—Tap iron and cinder from cupolas at direction of melter; also clean up the metal and the cinder runners. The work is sometimes divided into iron tapping and cinder tapping, the former being paid a higher rate.

NATURE OF WORK.—The work is analogous to that of the keeper's helpers at the blast furnace, though it is very much lighter and the heat is not so great, nor is there any considerable hazard connected with the occupation.

CUPOLA LINERS.

(Including Cupola Patchers.)

DUTIES.—Reline the cupolas with refractory material; also usually do other work, such as bottom making and ladle lining, when not employed at their regular duties. Where there are only a few cupolas no position is carried for this work, which is done by the ladle liners.

NATURE OF WORK.—The work is disagreeable and carries some danger from the falling of sculls and loose materials, although this can be effectually prevented. Owing to the difference in function which these men perform, the rates vary widely. In most cases nothing more than patching with fire clay is necessary, which can be done by comparatively low-grade men.

CUPOLA LINERS' HELPERS.

(Including Cupola Patchers' Helpers.)

DUTIES.—Wheel the materials needed, and generally assist the cupola liners in the performance of their duties.

NATURE OF WORK.—Chiefly unskilled work, requiring little experience.

IRON POURERS.

(Including Runner Men; Trough Men.)

DUTIES.—Operate the mechanism by which the ladle is turned down to pour the molten iron brought from the blast furnace or the cupolas into the converter before the beginning of the "blow." Also keep clean the "runner" or trough by which iron is led from the ladle into the converter. Sometimes perform also the duties of vessel scrappers.

NATURE OF WORK.—During the actual time of pouring, which, however, lasts only a few seconds, the men are exposed to extreme heat, and their comfort depends largely on the arrangement of the converters and on the distance at which they can work from the

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stream of molten metal. In a few plants, by electric or mechanical means, it is arranged that the ladle be turned from a distance and consequently the discomfort from the heat is greatly lessened.

VESSEL SCRAPPERS.

(Including Scrap Shovelers; Scrap Men.)

DUTIES.—Wheel and charge steel scrap into the mouth of the converter, at the signal of the blower, to lower the temperature of the molten metal. (In some plants this occupation is eliminated by introducing a little steam with the blast. "Scrapping" is usually preferred, however.)

NATURE OF WORK.—In some plants the scrap is shoveled into the mouth of the converter when it is turned on its side. During the few moments of actual exposure the heat is intense. The position is filled by relatively unskilled workmen. In other plants the scrap is charged by means of a chute while the converter is in an upright position, and when this is the case the conditions in respect to heat are rendered quite tolerable.

MANGANESE HEATERS.

(Including Manganese Men.)

DUTIES.—In charge of a small furnace in which ferro-manganese or spiegel is heated for recarburizing the blown metal; usually have helpers, who break and wheel materials and help to keep up the fire.

NATURE OF WORK.—The position is one requiring considerable experience to maintain the proper temperature. There is little heavy work connected with the position, but there is considerable exposure to high temperatures, due not only to the nature of the occupation but to the position of the furnace.

BLOWERS.

DUTIES.—In charge of and directly responsible for the conversion of the molten metal. The specific duties consist in regulating the blast, the valves being controlled by levers in the "pulpit," an elevated platform opposite the converters and usually directly in line of the blast, and in regulating the temperature by admitting steam with the blast or by signaling the vessel scrapper to add cold scrap. The blowers decide when the heat is fully "blown" and order the first regulator to tilt the converter, and signal what quantity of recarburizer shall be added; also keep a record of each heat in detail, although in some plants clerks keep the record of heats.

NATURE OF WORK.—This is one of the most responsible positions in the entire industry and highly skilled operators are required. Although more or less successful attempts have been made to use

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pyrometers and spectroscopes for the purpose, all decisions as to the temperature and chemical state of the metal are made almost entirely on the basis of the color and general appearance of the flame. This knowledge can be gained only through long experience in the mill. Furthermore, the work requires absolutely constant and unremitting attention, the process being repeated every 30 minutes or less during the turn, with such slight but important variations as absolutely escape anyone not versed in the art. The only leisure is when a new bottom is being put on or when the vessel is being otherwise repaired. In the majority of plants the blowers are exposed to extreme heat, especially during the summer, but in a few, particularly the smaller ones, where proper arrangements are easily made, the work is done under more favorable conditions as regards the heat.

REGULATORS, FIRST.

(Including Assistant Blowers.)

DUTIES.—Under direction of the blower operate the hydraulic levers by means of which the vessel is tilted to receive metal and during the course of the blow to receive scrap, etc., also to pour the metal into ladles.

NATURE OF WORK.—This is a responsible position, and requires a good deal of experience, as many things must be done on the judgment of the employee. The position may be regarded as one of training for that of blower. He is on the platform with the blower and subject to the same conditions of work.

REGULATORS, SECOND.

(Including Slag men.)

DUTIES.—Operate the levers which control the movements of the hydraulic jib-crane on which the casting ladle is mounted.

NOTE.—In some of the large plants operating three or four converters the work is somewhat differently divided, the first regulator controlling the converter only until the heat is blown, when a second regulator handles it for dumping, inspecting and repairing bottom, etc., while the third regulator controls the ladle cranes. In addition the second or third regulator frequently operates the "car pusher."

VESSEL MEN AND VESSEL MEN'S HELPERS.

(Including Vessel Foremen and Helpers.)

DUTIES.—Are responsible for and maintain the converter in good working order. Their duties consist in (1) inspection, (2) in changing and repairing bottoms, (3) in skulling, patching, and relining. After each "blow" the vessel is turned down so that the condition of its

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lining and particularly the bottom, where the blast is introduced through tuyeres and which is subject to the greatest wear, may be inspected. If the inspection shows the bottom to be in bad condition with the tuyeres nearly burned out, which occurs after from 20 to 30 heats, the entire bottom, which is constructed so that it may be easily removed, is taken off and a new bottom, which has been prepared by the bottom makers as described below, is put on. The new bottom is placed on a hydraulic jack, stationary or mounted on a movable truck, directly under the converter, the outer edges of the bottom are covered with a ring of moist fire-clay to give an air-tight connection with the vessel, and the whole is then pressed tightly against the bottom of the vessel by the hydraulic jack and held in place until the connections have been made. This operation is performed with remarkable rapidity. If only one or two tuyeres are shown to be badly burned, it is necessary only to "blank" them by closing the air holes with refractory material. This takes only a moment. When slag or other accretions collect on the nose of the converter, the vessel men or the helpers pull or pry it off with a long rod or bar. If the inspection shows a bad spot in the vessel lining, it is repaired by throwing wet "ball stuff," specially refractory material, on it and roughly tamping it down. The duties also include, where no separate occupation is carried for the purpose, the cleaning of "skulls" and "spittings" from the shield or stack into which the converter blows. When the lining is worn out, which occurs in the ordinary acid converter only after several thousand heats, the vessel men completely reline it. Since this is a comparatively infrequent though an important part of their duties, it is unnecessary to describe the operation in detail.

NATURE OF WORK.—The vessel men and helpers regularly work as a crew and there is little exact differentiation of duties, except that the vessel men supervise all the work and perform those parts which require the most experience and skill. The helpers are of all grades, some doing the most difficult work while others do little more than wheel materials. The position of vessel man is one which requires long experience and good judgment, and as emergencies must frequently be met rapidly, the men must have the ability to think and to act quickly. The work is intermittent in character, with short periods of the greatest activity followed by long periods of comparative inaction, save for inspection, to which one man can attend. In some of the work the men for short periods are exposed to excessively high temperatures, and in emergencies frequently take great risks of injury. When scrap is used for cooling, heavy pieces frequently fall; globules of molten metal called "sparks" are constantly being thrown out during the blow, and when the metal is poured into ladles explosions and overflows are not infrequent.

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BOTTOM MAKERS AND HELPERS.

DUTIES.—Repair and rebuild converter bottoms. The bottom consists essentially of (1) a cylindrical steel casing sloping out at the top to the diameter of the vessel, the lower part of which forms the "blast box" into which the blast is admitted by a large pipe. This casing is provided with keys or with other appliances by which it can be quickly and securely fastened to the body of the converter. (2) Above the "blast box" is the refractory bottom, which is pierced by a large number of small holes for admitting and distributing the blast in the vessel. In acid vessels these "tuyeres" or holes are formed in fire-clay bricks of special design (in practice the entire brick is known as a "tuyere,") around which ganister is rammed. When the bottom is removed by the vessel men, the bottom makers and helpers cool it with water and then chip out all the ganister and knock out the "tuyere bricks." New tuyere bricks are then placed in position, and crushed moist ganister is tightly rammed around them until it is level with their top. The entire bottom is then placed in an oven where it is kept at a steady heat until thoroughly dried. In addition to this work the bottom makers' helpers in many plants also grind the refractory materials used for this purpose and also for repairing vessels and ladles.

NATURE OF WORK.—The work is done by the bottom makers and helpers working as a crew and there is usually little distinction of duties. Bottom makers are responsible for and supervise the work, but also do a large part of it. The helpers vary in grade, some being merely unskilled laborers, while others are highly skilled. The work seldom requires any special haste and is therefore done much more leisurely than any other around the Bessemer department. It is free from special hazards, and except for chipping out the ganister and placing the bottom in the oven and removing it there are no disagreeable conditions of heat. Bottom makers must have considerable experience and must exercise extreme care, so that the position is one of some importance.

STEEL POURERS.

DUTIES.—In charge of and do the actual work of pouring (teeming) the steel from the ladle into the molds. The flow is controlled by a lever at the side of the vessel, attached to the stopper within the ladle. The pourer determines to what height in the mold the steel should be poured to give an ingot of the desired weight. He is in general charge of the entire casting crew of a mill and is responsible for the metal after it is tapped from the furnace until the ingots are ready for delivery to the blooming mill. Either he or one of his helpers makes a test casting from each ladle, which casting is given chemical analysis.

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NATURE OF WORK.—The position is one requiring some practical knowledge of metallurgy, but chiefly long experience in the handling of molten metals. In addition, the position demands hard manual labor at times and exposure to high temperatures. The position carries also considerable hazard from metal explosions and from the overturning of molds or ladles. A defective stopper, called a "running stopper," may cause splashing or explosion. The work is much more strenuous and is done under harder working conditions in the Bessemer than in the open-hearth department.

STOPPER SETTERS.

DUTIES.—Remove discarded stoppers of the ladles and inspect and place in position the new supply, by the raising and lowering of which the flow of steel through a nozzle in the bottom of the ladle is regulated. The stopper consists of a steel rod the height of the ladle inclosed in special hollow fire-brick cylinders, and on the lower end is a solid head usually made of a composition of graphite and fire clay and shaped to fit the nozzle. At the top the bar is bent to form a connection with the steel pourer's lever at the side of the ladle, by which it is raised and lowered. The stopper setters in a few plants also remove the old nozzle and set a new one in place. Sometimes also do a part of the steel pouring.

NATURE OF WORK.—The position is one which requires a large amount of experience and more than ordinary care and precaution, because a mistake in selecting or setting the stopper means almost certain injury to an employee, to say nothing of the loss of several tons of steel. Furthermore, the position is usually made to carry considerable supervisory duties, and to combine a number of minor functions which can not be listed in detail here. It is these differences in function and responsibility that explain the rather wide variations in rates which are found to appear in the different establishments. In the Bessemer department the work is done much more rapidly and constantly and under harder heat conditions than in the open hearth. There are also fewer emergencies in the open hearth which require decision and rapid action.

STOPPER SETTERS' HELPERS.

DUTIES.—Assist the stopper setters. Their specific duties usually consist in operating the small jib crane by which the stopper is removed finally or for inspection, in sledging or prying off any slag or metal which may interfere with the working of the stopper and the pouring ladle, and in removing worn-out nozzles and setting new ones in place, which is a comparatively simple operation, the old nozzle being pushed or sledged out from below and a new nozzle of fire clay inserted into the hole in the bottom of the ladle from above and

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pushed into place. The stopper setters' helpers also assist the steel pourers in emergencies.

NATURE OF WORK.—The work varies in difficulty and severity according to the particular combination of duties performed. In many plants where a large tonnage is produced the first helpers do all the difficult work, the stopper setters merely supervising and lending assistance and advice when a difficulty is encountered. As indicated by the rates, some of the helpers are little more than unskilled laborers. The helpers work under much the same conditions as the stopper setters, except that they are generally called on to do most of the hottest and hardest work.

MOLD CAPPERS.

(Including Cappers; Key-ups.)

DUTIES.—When soft steel is made, it is necessary to put an iron plate or "cap" on top of the mold and fasten it down by means of a bar inserted under two lugs. After the steel is cold, the bar is knocked out and the cap removed. In addition the mold cappers usually have other minor duties and act as steel pourers' helpers.

NATURE OF WORK.—The work in any case requires skill, but the severity of it through exposure to extreme heat as well as the hazard vary greatly between old and new methods and between establishments that have given thought to relieving the danger and discomfort of the work and those that have not. The chief danger comes from uncapping the molds too soon, so that the internal gases of the ingot cause an explosion. Various ways of avoiding this danger have been devised, which will be described elsewhere in the report. Under former conditions a number of molds arranged in a deep pit were cast at one time and in order to cap them it was often necessary to climb out on top of the molds full of hot metal, in which case the heat was almost unbearable. In all modern Bessemer plants the molds, mounted on small cars, are brought in succession before the steel pourer and mold capper, which gives great relief from the heat.

LADLE LINERS.

(Including Ladle Patchers; Bricklayers, ladle.)

DUTIES.—Patch and reline the ladles in which iron ("direct metal") is brought to the converter or open hearth, or in which steel is handled or cast. The ladles may be patched while still hot by throwing damp clay on the defective spots and tamping it into place. For relining or any considerable repairs the ladle must be removed. This work is sometimes differentiated into iron-ladle and steel-ladle lining, the latter being much more difficult and requiring workmen of higher grade. In the majority of plants, however, both types of ladles are lined by the same men, and in a few the entire work for the

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blast-furnace, open-hearth, and Bessemer departments is done by one set of men.

NATURE OF WORK.—In either case the ladle is first cleaned by the ladle liner's helpers, as described below, and either the entire lining or such part of it as the ladle liner judges on inspection to be defective is removed. If the ladle is to be entirely relined it is done by the ladle liners, with the assistance of the helpers, by building a wall of fire-brick, usually in two courses, around the entire inside of the steel casing. The bottom lining is then made by throwing in moist "ball stuff" (the most refractory of clay), which is tamped down until a homogeneous compact lining is formed. The whole of the brick wall around the sides is then covered with fire clay, which is rammed to fill all cavities between the bricks and to present a smooth surface. A fire (gas, wood, or coke) is then lighted inside the ladle and kept burning until the ladle is entirely dried out. The position is usually filled by skilled bricklayers. The greater part of the work is not especially hard, nor is it done under conditions of special hazard or discomfort.

LADLE LINER'S HELPERS.

(Including Ladle Cleaners; Skullers; Second Ladle Liners; Third Ladle Liners.)

DUTIES.—Remove "skulls" of slag and metal from the ladles; remove the entire ladle lining or such part as directed by the ladle liner; bring the materials required by the ladle liner; help to tamp down the clay lining; and, in general, assist him in his work.

NATURE OF WORK.—Cleaning and removing ladle linings is particularly hard work, and, as the ladles are cleaned as soon as possible after the metal is cast, the work is frequently done under conditions of excessive heat. The ladle is first turned upside down to dump any liquid slag or metal. It is then turned right side up and when cool enough the men remove the "skulls" with bars and sledges. In the case of iron ladles this work is made easier by constructing the ladle with a large hole in the bottom, which is covered by an iron plate, over which the refractory clay for the bottom is laid. When a ladle is ready for patching or relining this bottom plate, together with the clay bottom and any "skulls," is pushed up through the ladle by a hydraulic jack. The rest of the work is not very hard and requires little skill. The rates are proportioned largely to the difficulty and severity of the work.

INGOT STRIPPERS.

(Including Stripper Men; Ingot Cranemen.)

DUTIES.—Operate the crane for stripping ingots. In the modern plants the ingots are cast in molds mounted on small cars, which are brought one at a time in front of the steel-pourer's platform. After

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the ingot has sufficiently solidified and the cap (in the case of soft steel) has been removed these cars are removed by a narrow-gauge locomotive to the ingot stripper, which is frequently located some distance away, and in plants using both processes often does duty for both the Bessemer and open-hearth departments.

NATURE OF WORK.—The "ingot stripper" is an overhead hydraulic or electric crane of large capacity, equipped with special jaws for gripping the lugs on the side of the ingot mold, and special apparatus for lifting the mold clear of the ingot. Between the jaws is located a large plunger, which can be made to enter through the hole in the top of the mold and exert a pressure on top of the ingot when the mold is lifted. All operations are controlled by levers or controllers in the crane cab. The work requires considerable experience and judgment. The heat from the red-hot ingots is so intense that during the summer, if the work is at all constant, it is necessary to provide spell hands.

CRANEMEN.

(Including Mold Yard Cranemen; Mixer Cranemen; Magnet Cranemen; Stock Cranemen; Bottom House Cranemen; Pit Cranemen, etc.)

DUTIES.—Operate the numerous electric and hydraulic cranes in and around the Bessemer department. As the casting and stripping cranes are operated by employees in specified occupations, the cranes covered here are chiefly electric cranes of small capacity.

NATURE OF WORK.—As a whole the class of work is much lower than in the open-hearth department, much of it being in the hands of lads of no great experience. Most of the cranes are outside the Bessemer building proper and are therefore not exposed to excessive heat or to any hazards outside those regularly attaching to the position.

ENGINEERS, STATIONARY.

(Including Fan Engineers; Scrap Drop Engineers; Skip Engineers; Hoist Engineers, etc.)

DUTIES.—Operate small stationary engines used for hoists, slag drops, winches, etc.

NATURE OF WORK.—It is generally low-grade work, done under ordinary nonhazardous conditions.

CINDER MEN.

(Including Cinder Pitmen; Cinder Snappers; Cinder Dump Men; Slag Wheelers; Vessel Cinder Men; Slag Men, etc.)

DUTIES.—Clean up and remove the cinder and metal from the pit or floor of the Bessemer building, and take care of slag on the cinder dump.

NATURE OF WORK.—The work is as a whole unskilled. It is, however, for the most part, hard manual labor done under conditions of

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great heat, and, especially when working around and under the vessels and ladles, of great danger of being severely burned or of receiving minor injuries.

LABORERS, OTHER.

DUTIES.—Perform the large number of duties, requiring no skill, not covered by specific occupations, or which are not differentiated in various plants.

NATURE OF WORK.—Only unskilled workmen required. For the most part is not particularly heavy manual labor, nor is it done under conditions of special hazard or discomfort.

UNCLASSIFIED.

DUTIES.—Includes a large number of occupations required by local conditions, a few in which the numbers reported were too small to be shown separately, as well as mixer men, mixing-house men, cranemen's helpers and chasers, which are described in the open-hearth list, although not reported separately for the reasons thus given.

NATURE OF WORK.—The grade of work varies widely. All boys not reported under some specific occupation are included here. The high rates are those of special occupations required by local conditions.

EARNINGS AND HOURS AND DAYS OF WORK, BY OCCUPATIONS.

EARNINGS PER HOUR.

Data relative to earnings per hour for each occupation and each plant are shown in detail in Table I, Volume II of this report, and for each occupation and each district in Table II. Table I shows customary number of working days per week, customary number of working hours per day, normal number of employees, average earnings per hour, and number of employees earning each classified amount per hour. Table II shows for each occupation and each district the number of plants reporting data, the number of employees included, and the average earnings per hour. The table is so arranged that a comparison is easily made of the earnings of time workers and of tonnage workers in the different occupations within each of the districts and also of the earnings of each of the two classes of workers in the several districts.

The tables here presented summarize the information concerning earnings. The table which follows is a summary of Table II with the exception that time workers and tonnage workers are not shown separately but are combined. The table is so arranged that a comparison is easily made of earnings in each of the districts within an occupation and also a comparison of the earnings of the various occupations within a district.

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AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY PRINCIPAL DISTRICTS—BESSEMER CONVERTERS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Occupations.	Pittsburgh district.	Great Lakes and Middle West district.	Total, all districts.
Blowers:			
Plants	12	7	22
Employees	26	15	51
Average earnings per hour.....cents..	44.9	53.7	47.4
Blowing engineers:			
Plants	12	7	22
Employees	28	12	48
Average earnings per hour.....cents..	27.0	26.9	26.5
Bottom makers:			
Plants	13	8	24
Employees	26	13	44
Average earnings per hour.....cents..	36.2	25.5	31.5
Bottom makers' helpers:			
Plants	13	8	24
Employees	35	20	74
Average earnings per hour.....cents..	26.4	20.0	22.4
Cinder men:			
Plants	12	8	23
Employees	210	79	374
Average earnings per hour.....cents..	19.1	17.5	18.5
Cranemen:			
Plants	13	7	23
Employees	76	68	161
Average earnings per hour.....cents..	21.9	25.1	23.2
Cupola chargers:			
Plants	11	5	17
Employees	99	31	143
Average earnings per hour.....cents..	20.4	18.5	19.9
Cupola hoist men:			
Plants	7	1	9
Employees	25	2	32
Average earnings per hour.....cents..	23.5	15.5	21.7
Cupola liners:			
Plants	7	5	13
Employees	19	15	40
Average earnings per hour.....cents..	27.0	27.4	26.3
Cupola liners' helpers:			
Plants	4	3	7
Employees	28	6	34
Average earnings per hour.....cents..	20.1	17.1	19.6
Cupola melters:			
Plants	12	5	19
Employees	28	25	59
Average earnings per hour.....cents..	41.5	35.3	38.7
Cupola tappers:			
Plants	12	3	17
Employees	81	21	124
Average earnings per hour.....cents..	34.0	31.6	32.9
Engineers, stationary:			
Plants	3	5	9
Employees	8	19	29
Average earnings per hour.....cents..	18.9	20.3	19.7
Ingot strippers:			
Plants	13	8	22
Employees	37	25	67
Average earnings per hour.....cents..	32.0	24.0	28.3
Iron pourers:			
Plants	7	7	15
Employees	29	25	62
Average earnings per hour.....cents..	33.0	27.8	29.8
Laborers:			
Plants	13	8	24
Employees	775	447	1,470
Average earnings per hour.....cents..	16.7	16.3	16.4
Ladle liners:			
Plants	13	7	23
Employees	31	15	53
Average earnings per hour.....cents..	34.1	39.2	34.9
Ladle liners' helpers:			
Plants	13	8	24
Employees	55	25	90
Average earnings per hour.....cents..	25.1	23.1	24.0

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AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY PRINCIPAL DISTRICTS—BESSEMER CONVERTERS—Concluded.

Occupations.	Pittsburgh district.	Great Lakes and Middle West district.	Total, all districts.
Manganese heaters:			
Plants	10	4	15
Employees	25	7	34
Average earnings per hour...cents..	33.2	24.7	30.5
Mold cappers:			
Plants	9	8	17
Employees	51	27	78
Average earnings per hour...cents..	34.3	20.4	28.5
Regulators, first:			
Plants	12	8	22
Employees	31	16	53
Average earnings per hour...cents..	41.2	36.3	38.3
Regulators, second:			
Plants	11	5	16
Employees	36	11	47
Average earnings per hour...cents..	33.9	29.2	32.5
Steel pourers:			
Plants	13	8	23
Employees	36	28	69
Average earnings per hour...cents..	61.3	54.0	55.7
Stockers:			
Plants	12	7	21
Employees	514	135	730
Average earnings per hour...cents..	24.1	18.1	22.6
Stopper setters:			
Plants	13	7	22
Employees	45	18	71
Average earnings per hour...cents..	45.5	55.0	47.4
Stopper setters' helpers:			
Plants	10	5	17
Employees	50	19	76
Average earnings per hour...cents..	47.7	40.5	44.2
Vessel men:			
Plants	13	8	24
Employees	39	18	67
Average earnings per hour...cents..	59.3	60.5	57.5
Vessel men's helpers:			
Plants	13	8	24
Employees	61	34	122
Average earnings per hour...cents..	43.0	47.4	41.5
Vessel scrappers:			
Plants	10	8	19
Employees	32	28	62
Average earnings per hour...cents..	27.7	26.5	27.0
Unclassified:			
Plants	13	8	24
Employees	286	191	563
Average earnings per hour...cents..	20.5	18.5	19.4

Twenty-one of the 24 plants reporting and 85.59 per cent of the employees were in the Pittsburgh district and the Great Lakes and Middle West district. For this reason employees in the other districts are not discussed separately in the text analysis, and one plant is not shown in its district, but it is included in the total for all districts. In the above table the employees are entered in 30 occupation classifications (including unclassified), and in 22 of the 30 classifications the earnings were lower in the Great Lakes and Middle West district than in the Pittsburgh district.

The next table compares the earnings of time workers and tonnage workers. In almost every case the average earnings of tonnage workers were higher than the average earnings of time workers. The blowers are an exception to this rule—the 25 blowers on time

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basis averaged 49 cents per hour and the 26 blowers on the tonnage basis averaged 45.5 cents. In the occupation of stockers, which is practically unskilled labor, a marked difference is shown in favor of the tonnage workers. The 375 stockers on the tonnage basis received 28 cents per hour, and the 355 on the time basis received only 17.9 cents per hour. All employees classed as laborers were employed on the time basis, and the average for the 1,470 employees was 16.4 cents.

COMPARISON OF AVERAGE EARNINGS PER HOUR OF TIME WORKERS AND OF TONNAGE WORKERS, BY OCCUPATIONS—BESSEMER CONVERTERS.

Occupations.	Time.			Tonnage.			Time and tonnage combined.		
	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.
Blowers	12	25	$0.490	10	26	$0.455	22	51	$0.474
Blowing engineers	18	40	.265	4	8	.266	22	48	.265
Bottom makers	7	11	.289	17	33	.340	24	44	.315
Bottom makers' helpers	8	34	.173	17	40	.260	24	74	.224
Cinder men	17	284	.174	10	90	.223	23	374	.185
Cranemen	22	117	.208	10	44	.312	23	161	.232
Cupola chargers	11	97	.179	7	46	.256	17	143	.199
Cupola hoist men	7	23	.188	2	9	.304	9	32	.217
Cupola liners	12	35	.262	1	5	.265	13	40	.263
Cupola liners' helpers	7	34	.196	.....	.....	.....	7	34	.196
Cupola melters	6	13	.263	15	46	.421	19	59	.387
Cupola tappers	5	23	.232	14	101	.353	17	124	.329
Engineers, stationary	9	27	.197	1	2	.193	9	29	.197
Ingot strippers	8	23	.248	14	44	.308	22	67	.283
Iron pourers	6	15	.198	10	47	.343	15	62	.298
Laborers	24	1,470	.164	.....	.....	.....	24	1,470	.164
Ladle liners	2	4	.230	22	49	.360	23	53	.349
Ladle liners' helpers	17	44	.202	16	46	.279	24	90	.240
Manganese heaters	2	3	.195	13	31	.318	15	34	.305
Mold cappers	6	19	.198	11	59	.321	17	78	.285
Regulators, first	3	6	.305	20	47	.393	22	53	.383
Regulators, second	3	6	.275	14	41	.332	16	47	.325
Steel pourers	2	3	.338	21	66	.571	23	69	.557
Stockers	16	355	.179	12	375	.280	21	730	.226
Stopper setters	2	3	.283	20	68	.487	22	71	.474
Stopper setters' helpers	1	2	.206	17	74	.452	17	76	.442
Vessel men	3	5	.402	22	62	.592	24	67	.575
Vessel men's helpers	4	9	.239	21	113	.432	24	122	.415
Vessel scrapers	7	16	.208	12	46	.293	19	62	.270
Unclassified	23	434	.184	18	129	.229	24	563	.194

The table which follows shows for each of the principal occupations the number of plants reporting, normal number of employees, average earnings per hour, and per cent of employees earning each classified amount per hour. The occupations are in order following the processes of manufacture.

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PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS—BESSEMER CONVERTERS.

Occupations.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Stockers	21	730	$0.226	.....	.....	2.74	26.16	16.71	24.25	12.60	10.55	6.99	.....	.....	.....
Cupola chargers	17	143	.199	.....	.....	1.40	50.35	20.28	16.08	.....	11.89	.....	.....	.....	.....
Cupola melters	19	59	.387	.....	.....	.....	.....	1.69	6.78	23.73	25.42	13.56	23.73	.....	5.08
Cupola tappers	17	124	.329	.....	.....	.....	3.23	1.61	13.71	23.39	40.32	12.10	5.65	.....	.....
Blowing engineers	22	48	.265	.....	.....	.....	.....	.....	20.83	70.83	8.33	.....	.....	.....	.....
Blowers	22	51	.474	.....	.....	.....	.....	.....	.....	.....	31.37	35.29	13.73	15.69	3.92
Regulators, first	22	53	.383	.....	.....	.....	.....	.....	15.09	18.87	18.87	26.42	11.32	9.43	.....
Vessel scrappers	19	62	.270	.....	.....	.....	9.68	9.68	35.48	16.13	11.29	17.74	.....	.....	.....
Vessel men	24	67	.575	.....	.....	.....	.....	.....	.....	.....	22.39	20.90	13.43	22.39	20.90
Vessel men's helpers	24	122	.415	.....	4.10	.....	.....	.82	13.11	18.03	16.39	22.13	11.48	9.02	4.92
Bottom makers	24	44	.315	.....	.....	.....	.....	4.55	22.73	18.18	38.64	15.91	.....	.....	.....
Bottom makers' helpers	24	74	.224	.....	.....	18.92	10.81	18.92	25.68	17.57	8.11	.....	.....	.....	.....
Steel pourers	23	69	.557	.....	.....	.....	.....	.....	4.35	1.45	11.59	18.84	20.29	13.04	30.43
Stopper setters	22	71	.475	.....	.....	.....	.....	.....	2.82	23.94	23.94	8.45	12.68	11.27	16.90
Ladle liners	23	53	.349	.....	.....	.....	.....	.....	16.98	13.21	45.28	15.09	9.43	.....	.....
Ingot strippers	22	67	.283	.....	.....	.....	.....	2.99	29.85	37.31	7.46	22.39	.....	.....	.....
Cinder men	23	374	.185	.....	1.07	16.31	43.85	20.85	6.68	6.68	4.55	.....	.....	.....	.....
Laborers	24	1,470	.164	.....	.34	34.49	65.17	.....	.....	.....	.....	.....	.....	.....	.....
Other occupations[1]	.....	1,246	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total, all occupations	24	4,927	.232	0.47	.63	13.31	33.18	9.78	14.19	8.79	9.36	5.32	2.23	1.38	1.36

[1] Details not separately reported.

The laborers are the lowest paid employees included in the above table and averaged only 16.4 cents per hour. Of the laborers 34.49 per cent earned 14 and under 16 cents per hour, and 65.17 per cent earned 16 and under 18 cents per hour. The highest paid employees included in the above table are vessel men, and the average earnings per hour were 57.5 cents. The lowest earnings for vessel men was 30 and under 40 cents per hour and the highest $1 and under $1.25. Of the vessel men 43.29 per cent received less than 50 cents per hour.

The next summary shows for each of the districts the number of plants reporting, normal number of employees, average earnings per hour, and number of employees earning each classified amount per hour. Time workers and tonnage workers are shown separately, and the two classes are also combined.

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NUMBER OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS, BY DISTRICTS—BESSEMER CONVERTERS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Number of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
TIME WORKERS.															
Pittsburgh	13	1,696	$0.183	11	5	118	1,047	227	169	92	7	18	2	.....	.....
Great Lakes and Middle West	8	1,052	.184	2	12	188	499	128	153	41	21	1	3	2	2
Total, all districts	24	3,180	.181	20	22	649	1,586	377	336	133	28	20	5	2	2
TONNAGE WORKERS.															
Pittsburgh	13	1,126	.347	.....	.....	2	19	55	144	220	350	194	73	45	24
Great Lakes and Middle West	7	343	.369	.....	.....	.....	24	22	94	39	38	34	30	21	41
Total, all districts	23	1,747	.341	3	9	7	49	105	363	300	433	242	105	66	65
TIME AND TONNAGE WORKERS.															
Pittsburgh	13	2,822	.241	11	5	120	1,066	282	313	312	357	212	75	45	24
Great Lakes and Middle West	8	1,395	.226	2	12	188	523	150	247	80	59	35	33	23	43
Total, all districts	24	4,927	.232	23	31	656	1,635	482	699	433	461	262	110	68	67

The average hourly earnings for the 4,927 employees was 23.2 cents. The average earnings for the 3,180 employees paid on the time basis was 18.1 cents, and for the 1,747 employees on the tonnage basis 34.1 cents per hour. This marked difference between earnings of time workers and tonnage workers is due in part to the fact that a larger proportion of the tonnage workers than of the time workers are skilled employees. It is also true, however, as has been noted on a preceding page, that even in the same occupation the tonnage workers have higher average earnings than do time workers.

The lowest rate reported was under 10 cents per hour and the highest $1.25 or over. Only 2.74 per cent of all employees, however, received 60 cents and more per hour, while 47.59 per cent earned less than 18 cents per hour. The table which follows shows the per cent of employees earning each classified amount per hour. These percentages are computed from the third section of the table immediately preceding, in which time workers and tonnage workers are combined.

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PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, AND AVERAGE HOURLY EARNINGS, BY DISTRICTS—BESSEMER CONVERTERS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Pittsburgh	13	2,822	$0.241	0.39	0.18	4.25	37.77	9.99	11.09	11.06	12.65	7.51	2.66	1.59	0.85
Great Lakes and Middle West	8	1,395	.226	.14	.86	13.48	37.49	10.75	17.71	5.73	4.23	2.51	2.37	1.65	3.08
Total, all districts	24	4,927	.232	.47	.63	13.31	33.18	9.78	14.19	8.79	9.36	5.32	2.23	1.38	1.36

From the above table it is seen that 33.18 per cent earned 16 and under 18 cents per hour. The second largest group, 14.19 per cent, earned 20 and under 25 cents per hour, and the third largest group, 13.31 per cent, earned 14 and under 16 cents per hour.

The summary in the form of cumulative percentages which follows shows that 14.41 per cent of all employees earned less than 16 cents per hour, 47.59 per cent earned less than 18 cents per hour, and 71.56 per cent earned less than 25 cents per hour.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR—BESSEMER CONVERTERS.

Earnings per hour.	Number of employees.	Per cent of total number of employees.	Earnings per hour.	Number of employees.	Per cent of total number of employees.
Under 16 cents	710	14.41	Under 30 cents	3,959	80.35
Under 18 cents	2,345	47.59	Under 40 cents	4,420	89.71
Under 20 cents	2,827	57.37	Under 50 cents	4,682	95.03
Under 25 cents	3,526	71.56			

The per cent of employees earning less than certain specified amounts per hour is shown by principal districts in the table which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY PRINCIPAL DISTRICTS—BESSEMER CONVERTERS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning per hour.						
			Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
Pittsburgh	2,822	$0.241	4.82	42.59	52.58	63.67	74.73	87.38	94.89
Great Lakes and Middle West	1,395	.226	14.48	51.97	62.72	80.43	86.16	90.39	92.90
Total, all districts	4,927	.232	14.41	47.59	57.37	71.56	80.35	89.71	95.03

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Of the total number of employees 85.59 per cent were in the Pittsburgh and the Great Lakes and Middle West districts, and therefore the other districts are omitted from the text discussion. The earnings for these two districts were very similarly distributed, the average earnings for the Great Lakes and Middle West district being 1.5 cents per hour lower, influenced largely by the 14.48 per cent receiving less than 16 cents per hour. The earnings were under 18 cents per hour for 51.97 per cent of the 1,395 employees in the Great Lakes and Middle West district, and for 42.59 per cent of the 2,822 employees in the Pittsburgh district. The earnings were under 25 cents per hour for 80.43 per cent of the employees of the Great Lakes and Middle West district and 63.67 per cent of the employees of the Pittsburgh district.

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working hours per week for each occupation and each plant are presented in detail in Table I, Volume II of this report. These data are summarized in the tables which follow. The first of these tables shows for each occupation the number of plants reporting, the normal number of employees, the average customary working hours per week, and the number of employees whose customary working time was each specified number of hours per week.

NUMBER OF EMPLOYESS IN EACH OCCUPATION WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, AND AVERAGE HOURS WORKED PER WEEK—BESSEMER CONVERTERS.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Blowers	22	51	69.7	6	.....	.....	.....	10	25	5	5	.....
Blowing engineers	22	48	74.6	.....	.....	.....	.....	8	23	8	9	.....
Bottom makers	24	44	70.6	3	.....	1	.....	3	30	4	3	.....
Bottom makers' helpers	24	74	69.2	3	.....	12	.....	4	47	4	4	.....
Cinder men	23	374	72.6	6	15	5	.....	54	153	64	77	.....
Cranemen	23	161	72.4	15	.....	5	1	20	65	12	43	.....
Cupola chargers	17	143	74.8	6	9	.....	.....	17	41	.....	70	.....
Cupola hoist men	9	32	61.8	6	7	.....	.....	7	10	2	.....	.....
Cupola liners	13	40	71.8	.....	.....	5	2	7	17	.....	9	.....
Cupola liners' helpers	7	34	73.2	.....	.....	.....	4	16	4	.....	10	.....
Cupola melters	19	59	64.5	15	3	.....	.....	12	25	2	2	.....
Cupola tappers	17	124	63.9	43	.....	.....	.....	36	18	18	9	.....
Engineers, stationary	9	29	73.1	.....	.....	1	1	3	18	.....	6	.....
Ingot strippers	22	67	66.3	12	6	.....	.....	7	32	4	6	.....
Iron pourers	15	62	61.0	15	12	.....	.....	8	25	2	.....	.....
Laborers	24	1,470	74.3	.....	.....	44	51	331	430	218	341	55
Ladle liners	23	53	68.2	6	.....	3	.....	7	31	4	2	.....
Ladle liners' helpers	24	90	70.1	6	.....	3	3	12	52	6	8	.....
Manganese heaters	15	34	61.1	15	.....	.....	.....	4	13	2	.....	.....
Mold cappers	17	78	59.1	21	24	.....	.....	2	27	.....	4	.....
Regulators, first	22	53	67.2	9	3	.....	.....	5	30	2	4	.....
Regulators, second	16	47	64.0	9	9	.....	.....	2	21	2	4	.....
Steel pourers	23	69	56.6	42	3	.....	.....	7	13	.....	4	.....
Stockers	21	730	65.3	157	37	.....	27	171	279	4	55	.....
Stopper setters	22	71	55.6	42	6	.....	.....	10	11	.....	2	.....
Stopper setters' helpers	17	76	54.2	51	6	.....	.....	9	6	.....	4	.....
Vessel men	24	67	59.4	33	3	.....	.....	7	20	.....	4	.....
Vessel men's helpers	24	122	58.3	63	6	.....	.....	24	21	.....	8	.....
Vessel scrappers	19	62	71.4	6	.....	.....	.....	6	36	4	10	.....
Unclassified	24	563	72.3	21	.....	19	5	67	305	59	87	.....
Total, all occupations	24	4,927	69.5	611	149	98	94	876	1,828	426	790	55

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The table which follows shows for the principal occupations the per cent of employees customarily working each classified number of hours per week:

PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK—BESSEMER CONVERTERS.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Stockers	21	730	65.3	21.51	5.07	.....	3.70	23.42	38.22	0.55	7.53	.....
Cupola chargers	17	143	74.8	4.20	6.29	.....	.....	11.89	28.67	.....	48.95	.....
Cupola melters	19	59	64.5	25.42	5.08	.....	.....	20.34	42.37	3.39	3.39	.....
Cupola tappers	17	124	63.9	34.68	.....	.....	.....	29.03	14.52	14.52	7.26	.....
Blowing engineers	22	48	74.6	.....	.....	.....	.....	16.67	47.92	16.67	18.75	.....
Blowers	22	51	69.7	11.76	.....	.....	.....	19.61	49.02	9.80	9.80	.....
Regulators, first	22	53	67.2	16.98	5.66	.....	.....	9.43	56.60	3.77	7.55	.....
Vessel scrappers	19	62	71.4	9.68	.....	.....	.....	9.68	58.06	6.44	16.13	.....
Vessel men	24	67	59.4	49.25	4.48	.....	.....	10.45	29.85	.....	5.97	.....
Vessel men's helpers	24	122	58.3	51.64	4.92	.....	.....	19.67	17.21	.....	6.56	.....
Bottom makers	24	44	70.6	6.82	.....	2.27	.....	6.82	68.18	9.09	6.82	.....
Bottom makers' helpers	24	74	69.2	4.05	.....	16.22	.....	5.41	63.51	5.41	5.41	.....
Steel pourers	23	69	56.6	60.87	4.35	.....	.....	10.14	18.85	.....	5.80	.....
Stopper setters	22	71	55.6	59.15	8.45	.....	.....	14.08	15.49	.....	2.82	.....
Ladle liners	23	53	68.3	11.32	.....	5.66	.....	13.21	58.49	7.55	3.77	.....
Ingot strippers	22	67	66.3	17.91	8.96	.....	.....	10.45	47.76	5.97	8.96	.....
Cinder men	23	374	72.6	1.60	4.01	1.34	.....	14.44	40.91	17.11	20.59	.....
Laborers	24	1,470	74.3	.....	.....	2.99	3.47	22.52	29.25	14.83	23.20	3.74
Other occupations [1]	.....	1,246	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total, all occupations	24	4,927	69.5	12.40	3.02	1.99	1.91	17.78	37.10	8.65	16.03	1.12

[1] Details not separately reported.

The above table shows that in three of the occupations more than one-half of the employees worked 48 hours per week and under. Those occupations are steel pourers, with 60.87 per cent working 48 hours and under per week; stopper setters, with 59.15 per cent; and vessel men's helpers, with 51.64 per cent. Of vessel men, 49.25 per cent were working 48 hours and under per week. The work connected with these occupations is extremely trying, owing to the great heat.

Several unskilled occupations, in which a large number of employees are found, are included in the above table. Of the 1,470 laborers, 26.94 per cent worked 84 hours and over per week, and 71.02 per cent worked 72 hours and over per week.

Of the 374 cinder men 78.61 per cent worked 72 hours and over per week, and 20.59 per cent worked 84 hours. Of the stockers 46.30 per cent worked 72 hours and over per week.

The table which follows shows for each of the principal occupations included in the preceding table the per cent of the employees customarily working 72 hours and over per week and also the per cent of employees customarily working 84 hours and over per week. The percentages are in cumulative form, i. e., the employees working 84 hours and over are also included in the column showing the per cent of employees customarily working 72 hours and over.

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PER CENT OF EMPLOYEES IN PRINCIPAL OCCUPATIONS CUSTOMARILY WORKING 72 HOURS AND OVER PER WEEK—BESSEMER CONVERTERS.

Occupations.	Normal number of employees.	Per cent of employees whose customary working hours per week were—	
		72 and over.	84 and over.
Stockers	730	46.30	7.53
Cupola chargers	143	77.62	48.95
Cupola melters	59	49.15	3.39
Cupola toppers	124	36.30	7.26
Blowing engineers	48	83.34	18.75
Blowers	51	68.62	9.80
Regulators, first	53	67.92	7.55
Vessel scrappers	62	80.63	16.13
Vessel men	67	35.82	5.97
Vessel men's helpers	122	23.77	6.56
Bottom makers	44	84.09	6.82
Bottom makers' helpers	74	74.33	5.41
Steel pourers	69	24.65	5.80
Stopper setters	71	18.31	2.82
Ladle liners	53	69.81	3.77
Ingot strippers	67	62.69	8.96
Cinder men	374	78.61	20.59
Laborers	1,470	71.02	26.94
Other occupations[1]	1,246	.....	.....
Total, all occupations	4,927	62.90	17.15

[1] Details not separately reported.

The next table is the summary showing customary working hours for employees in the principal districts. One district with but a single plant is not shown in detail, but is included in the totals. The time workers and the tonnage workers are shown separately.

NUMBER OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, AND AVERAGE HOURS WORKED PER WEEK, BY DISTRICTS—BESSEMER CONVERTERS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
TIME WORKERS.												
Pittsburgh	13	1,696	74.0	70	.....	13	58	266	546	330	358	55
Great Lakes and Middle West	8	1,052	75.3	6	.....	3	7	36	668	31	301	.....
Total, all districts	24	3,180	73.5	76	.....	92	67	573	1,244	361	712	55
TONNAGE WORKERS.												
Pittsburgh	13	1,126	59.3	451	149	6	25	67	353	55	20	.....
Great Lakes and Middle West	7	343	68.1	84	.....	.....	2	.....	189	10	58	.....
Total, all districts	23	1,747	62.4	535	149	6	27	303	584	65	78	.....
TIME AND TONNAGE WORKERS.												
Pittsburgh	13	2,822	68.2	521	149	19	83	333	899	385	378	55
Great Lakes and Middle West	8	1,395	73.5	90	.....	3	9	36	857	41	359	.....
Total, all districts	24	4,927	69.5	611	149	98	94	876	1,828	426	790	55

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The average customary hours for the 3,180 time workers was 73.5 per week, and for the 1,747 tonnage workers 62.4. The shorter hours for tonnage workers is due largely to the fact that a larger proportion of the tonnage than of the time workers is in skilled occupations and the customary hours are shorter in skilled than in unskilled occupations.

The table which follows shows for time workers and tonnage workers combined the per cent of employees customarily working each classified number of hours per week. The total for all districts and the totals for the Pittsburgh district and the Great Lakes and Middle West district are placed in comparison.

PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, AND AVERAGE HOURS WORKED PER WEEK BY DISTRICTS—BESSEMER CONVERTERS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employes whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Pittsburgh.....	13	2,822	68.2	18.46	5.28	0.67	2.94	11.80	31.86	13.64	13.39	1.96
Great Lakes and Middle West..	8	1,395	73.5	6.45	.....	.22	.65	2.58	61.43	2.94	25.73	.....
Total all districts.	24	4,927	69.5	12.40	3.02	1.99	1.91	17.78	37.10	8.65	16.03	1.12

The average hours per week were considerably higher in the Great Lakes and Middle West district than in the Pittsburgh district, the difference being 5.3 hours.

Eighty-four hours was the customary working time for 25.73 per cent of the employees in the Great Lakes and Middle West district, and 84 hours and over for 15.34 per cent of the employees in the Pittsburgh district. Seventy-two hours and over per week was the customary working time for 90.10 per cent of the employees in the Great Lakes and Middle West district, and for 60.84 per cent of the employees in the Pittsburgh district. Considering all districts combined, 84 hours and over was the customary working time for 17.15 per cent of the employees, and 72 hours and over was the customary working time for 62.90 per cent of all employees. Seventy-two hours per week was the customary working time for 37.10 per cent of all employees, and 84 hours per week was the customary working time for 16.03 per cent of all employees.

The average customary working time per week for the total number of employees was 69.5 hours. The number of employees working 84 hours and over per week was almost exactly the same as the number working less than 60 hours per week.

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DAYS WORKED PER WEEK.

Under each occupation the customary working days or turns per week for each plant are shown in Table 1, Volume II of this report. These data are briefly summarized here. The table which follows shows for each occupation the number of plants reporting, the normal number of employees, and the number of employees whose customary working time was each specified number of days or turns per week:

NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH SPECIFIED NUMBER OF DAYS PER WEEK—BESSEMER CONVERTERS.

Occupations.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Blowers	22	51	.....	3	43	.....	5
Blowing engineers	22	48	.....	4	27	6	11
Bottom makers	24	44	.....	2	39	.....	3
Bottom makers' helpers	24	74	.....	2	68	.....	4
Cinder men	23	374	.....	19	272	.....	83
Cranemen	23	161	.....	4	101	2	54
Cupola chargers	17	143	.....	13	58	2	70
Cupola hoist men	9	32	.....	5	23	4	.....
Cupola liners	13	40	.....	.....	28	.....	12
Cupola liners' helpers	7	34	.....	.....	8	.....	26
Cupola melters	19	59	.....	4	51	2	2
Cupola tappers	17	124	.....	16	85	4	19
Engineers, stationary	9	29	.....	2	20	.....	7
Ingot strippers	22	67	.....	5	56	.....	6
Ingot pourers	15	62	.....	8	54	.....	.....
Laborers	24	1,470	.....	181	619	74	596
Ladle liners	23	53	.....	3	45	.....	5
Ladle liners' helpers	24	90	.....	5	74	.....	11
Manganese heaters	15	34	.....	.....	34	.....	.....
Mold cappers	17	78	.....	.....	74	.....	4
Regulators, first	22	53	.....	3	46	.....	4
Regulators, second	16	47	.....	.....	43	.....	4
Steel pourers	23	69	.....	3	62	.....	4
Stockers	21	730	.....	41	[1] 577	24	88
Stopper setters	22	71	.....	6	63	.....	2
Stopper setters' helpers	17	76	.....	5	67	.....	4
Vessel men	24	67	.....	3	60	.....	4
Vessel men's helpers	24	122	.....	12	102	.....	8
Vessel scrappers	19	62	.....	.....	52	.....	10
Unclassified	24	563	.....	47	387	20	109
Total	24	4,927	.....	396	[1] 3,238	138	1,155

[1] Including 78 employees who worked 5, 6, and 7 days in rotation.

Six days or turns per week was the customary working time for 65.72 per cent of the total number of employees in the Bessemer converting mills. Seven days or turns per week was the customary working time for 23.44 per cent of all employees; 5 and 6 days or turns, alternating, for 8.04 per cent of all employees; 6 and 7 days or turns, alternating, for 2.80 per cent; and 5, 6, and 7 days or turns in rotation for 1.58 per cent of all employees.

The table which follows shows for each of the principal occupations the per cent of employees customarily working each specified number of days or turns per week.

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PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH SPECIFIED NUMBER OF DAYS PER WEEK—BESSEMER CONVERTERS.

Occupations.	Number of plants.	Normal number of employees.	Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Stockers	21	730	.....	5.62	79.04	3.29	12.05
Cupola chargers	17	143	.....	9.09	40.56	1.40	48.95
Cupola melters	19	59	.....	6.78	86.44	3.39	3.39
Cupola tappers	17	124	.....	12.90	68.55	3.23	15.32
Blowing engineers, stationary	22	48	.....	8.33	56.25	12.50	22.92
Blowers	22	51	.....	5.88	84.31	.....	9.80
Regulators, first	22	53	.....	5.66	86.79	.....	7.55
Vessel scrappers	19	62	.....	.....	83.87	.....	16.13
Vessel men	24	67	.....	4.48	89.55	.....	5.97
Vessel men's helpers	24	122	.....	9.84	83.61	.....	6.56
Bottom makers	24	44	.....	4.55	88.64	.....	6.82
Bottom makers' helpers	24	74	.....	2.70	91.89	.....	5.41
Steel pourers	23	69	.....	4.35	89.86	.....	5.80
Stopper setters	22	71	.....	8.45	88.73	.....	2.82
Ladle liners	23	53	.....	5.66	84.91	.....	9.43
Ingot strippers	22	67	.....	7.46	83.58	.....	8.96
Cinder men	23	374	.....	5.08	72.73	.....	22.19
Laborers	24	1,470	.....	12.31	42.11	5.03	40.54
Other occupations [1]	.....	1,246	.....	.....	.....	.....	.....
Total, all occupations	24	4,927	.....	8.04	65.72	2.80	23.44

[1] Details not separately reported.

The principal occupations showing the greatest proportion of employees working 7 days or turns per week are cupola chargers with 48.95 per cent of all employees, laborers 40.54 per cent, blowing engineers 22.92 per cent, cinder men 22.19 per cent, vessel scrappers 16.13 per cent, cupola tappers 15.32 per cent, and stockers 12.05 per cent.

The table which follows shows for each of the principal districts the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS PER WEEK, BY PRINCIPAL DISTRICTS—BESSEMER CONVERTERS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Pittsburgh	13	2,822	.....	.....	[1] 2,009	111	702	.....	.....	71.19	3.93	24.88
Great Lakes and Middle West	8	1,395	.....	.....	968	27	400	.....	.....	69.39	1.94	28.67
Total, all districts	24	4,927	.....	396	[1] 3,238	138	1,155	.....	8.04	65.72	2.80	23.44

[1] Including 78 employees who worked 5, 6, and 7 days in rotation.

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In the Pittsburgh district 71.19 per cent and in the Great Lakes and Middle West district 69.39 per cent of the total number of employees worked 6 days or turns per week, and in the same districts 24.88 and 28.67 per cent, respectively, worked 7 days or turns per week.

OPEN-HEARTH FURNACES.

INTRODUCTION.

The data relative to earnings and hours of work are summarized briefly in the pages immediately following and analyzed in more detail on pages 94 to 107.

SUMMARY OF EARNINGS AND HOURS AND DAYS OF WORK.

EARNINGS.

Data relative to earnings were reported for 12,421 employees in special occupations in 80 open-hearth plants.

Of the 12,421 employees included in this report on open-hearth plants, 29.64 per cent earned 16 and under 18 cents per hour. The second largest group, 17.68 per cent, earned 20 and under 25 cents per hour; and the third largest group, 10.45 per cent, earned under 14 cents per hour. The large number earning less than 14 cents per hour is chiefly due to the employment of a number of boys. The average earnings were lowest in the Eastern district and highest in the Pittsburgh district. The averages here given are for all occupations taken together, including both skilled and unskilled employees. Of the total number of employees 48.55 per cent were in the Pittsburgh district and 94.53 per cent were in the Pittsburgh, the Great Lakes and Middle West, and the Eastern districts. The average earnings per hour for the 12,421 employees were 21.9 cents.

The distribution of these earnings in the separate districts is shown in the table which follows:

PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—OPEN-HEARTH FURNACES.

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.								
			Under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 cents and over.
New England	204	$0.221	0.98	25.98	18.14	5.39	25.98	10.78	6.86	2.94	2.94
Eastern	2,720	.191	25.15	19.96	12.87	8.24	16.51	9.67	5.44	1.10	1.07
Pittsburgh	6,030	.230	6.19	5.09	33.18	8.42	19.07	10.55	10.36	5.46	1.67
Great Lakes and Middle West	2,991	.220	3.28	8.49	40.62	7.36	15.81	6.85	11.00	4.31	2.27
Southern	476	.196	29.62	12.82	16.39	4.62	14.92	7.98	5.46	7.35	.84
Total, all districts.	12,421	.219	10.45	9.81	29.64	7.93	17.68	9.37	9.19	4.26	1.67

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The summary in the form of cumulative percentages which follows shows that 20.26 per cent of all employees earned less than 16 cents, 49.90 per cent earned less than 18 cents, and 75.51 per cent earned less than 25 cents per hour. Only 15.12 per cent earned as much as 30 cents per hour, although the employees in this department include the melters, who are in general charge of the operations of the department, and such employees as steel pourers, who are among the most skilled in the entire industry. As the average hours per full week for this department are 74.5, it is seen that only 15.12 per cent of the employees earn as much as $22.35 per week when they are working full time. Only 1.67 per cent earn as much as 50 cents per hour.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—OPEN-HEARTH FURNACES.

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning per hour.							
			Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	204	$0.221	0.98	26.96	45.10	50.49	76.47	87.25	94.11	97.05
Eastern	2,720	.191	25.15	45.11	57.98	66.22	82.73	92.40	97.84	98.94
Pittsburgh	6,030	.230	6.19	11.28	44.46	52.88	71.95	82.50	92.86	98.32
Great Lakes and Middle West	2,991	.220	3.28	11.77	52.39	59.75	75.56	82.41	93.41	97.72
Southern	476	.196	29.62	42.44	58.83	63.45	78.37	86.35	91.81	99.16
Total, all districts	12,421	.219	10.45	20.26	49.90	57.83	75.51	84.88	94.07	98.33

The above comparison shows that the earnings were under 14 cents for 29.62 per cent of the 476 employees in the Southern district, 25.15 per cent of the 2,720 employees in the Eastern district, 6.19 per cent of the 6,030 employees in the Pittsburgh district, 3.28 per cent of the 2,991 employees in the Great Lakes and Middle West district, and 0.98 per cent of the 204 employees in the New England district.

The earnings were under 18 cents per hour for 58.83 per cent of the employees in the Southern district, 57.98 per cent of the employees in the Eastern district, 52.39 per cent of the employees in the Great Lakes and Middle West district, 45.10 per cent of the employees in the New England district, and 44.46 per cent of the employees in the Pittsburgh district.

One further point may be deduced from these tables. The rates under 18 cents per hour for the New England, the Pittsburgh, and the Great Lakes and Middle West districts, and the rates under 16 cents per hour for the Eastern and Southern districts represent the wages at which only boys and unskilled workmen can be employed. It may therefore be said that in the New England, Eastern, and Pittsburgh districts approximately 45 per cent of the entire employees

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in the open-hearth department, in the Great Lakes and Middle West district 52 per cent, and in the Southern district 42 per cent were unskilled laborers or boys.

HOURS OF LABOR.

The customary working hours per week were reported for 12,421 employees in special iron and steel occupations in 80 open-hearth plants. For 75.48 per cent of the 12,421 employees the customary working time was 72 hours or over per week. The customary working hours for only 1.62 per cent of the total number of employees were less than 60 per week.

The average and the classified customary hours per week are shown in the following summary:

PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY PRINCIPAL DISTRICTS—OPEN-HEARTH FURNACES.

Districts.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—				
			60 and under.	Over 60 and under 72.	72.	Over 72 and under 84.	84 and over.
New England	204	64.5	46.57	48.53	.....	3.92	0.98
Eastern	2,720	72.4	12.76	34.78	9.93	21.88	20.66
Pittsburgh	6,030	75.3	3.25	14.79	27.03	39.93	14.99
Great Lakes and Middle West	2,991	75.2	9.43	5.38	38.15	16.01	31.03
Southern	476	76.6	5.46	.42	42.02	16.18	35.92
Total, all districts	12,421	74.5	7.62	16.91	26.09	28.72	20.67

Of the total employees 94.53 per cent were in three districts—the Eastern, the Pittsburgh, and the Great Lakes and Middle West. In these districts the lowest average hours per week were 72.4 in the Eastern district, and the highest average hours per week were 75.3 in the Pittsburgh district.

Of these three principal districts the Great Lakes and Middle West reported the largest proportion, 85.19 per cent, working at least 72 hours per week, which represents 12 hours per day for six days. The Pittsburgh district was next, with 81.95 per cent, and the Eastern district much lower, with 52.47 per cent, working at least 72 hours per week. Similarly, of the three principal districts the Great Lakes and Middle West reported the largest proportion, 31.03 per cent, working at least 84 hours per week, which means seven days of at least 12 hours each, the Eastern district being the next lower, with 20.66 per cent, while the Pittsburgh district was still lower, with only 14.99 per cent.

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DAYS PER WEEK.

Six days, or turns, per week was the customary working time for 5,485 employees, or 44.16 per cent of the 12,421 employees in special iron and steel occupations in 80 open-hearth plants. Seven days, or turns, per week was the customary working time for 3,395 employees, or 27.33 per cent of the total, and six and seven turns, alternating, was the customary working time for 3,092, or 24.89 per cent of the total. In other words, 6,487 employees, or more than one-half of the total number connected with production in this department, were employed every day in the week, including Sunday, for some part of the time. It should be stated in this connection that the number reported above includes very few, if any, of the employees who are required on what is known as the "gas turn." By this term is meant the period in which active production is not going on, but during which it is necessary to keep furnaces hot. This is done, so far as the employees included in the above statement are concerned, by simply reversing the gas and air from time to time, since the gasmen who tend the gas producers are not included. This work is done by a small proportion of the employees in rotation, so that no one man works on the gas turn very frequently. For this reason this "gas turn" is not included in the seven days, or turns, reported above. Except for the few men required for this "gas turn," there is no technical necessity for any of the men directly connected with production to be on duty for seven days per week.

The reason for the employment of so many persons on every day of the week was that in many cases open-hearth plants were being run at full capacity on Sunday as well as other days during May, 1910, and also for the greater part of that year, during which there was a large demand for steel.

GENERAL DESCRIPTION OF EQUIPMENT AND METHOD OF OPERATION.

The open-hearth process has within the last few years become the most important method used for producing steel. The very rapid growth of this process in this country is due to three main facts: First, the process in the open-hearth furnace is under much closer control than the process in the Bessemer converter, and a higher and more uniform grade of steel can therefore be produced; second, it is possible in the basic open hearth to use material containing considerable phosphorus, which is not possible with the acid Bessemer process; third, the open hearth provided a means for using up the tremendous amount of steel scrap which was accumulating at a rapid rate, because the puddling or busheling process can use only a small part of it in making wrought iron, and the Bessemer process none directly, except a small amount thrown in to lower the temperature when the bath is

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too hot. With the recent developments of the open hearth it is possible to obtain steel from almost any pig iron or scrap.

Open-hearth furnaces are divided into two main classes, acid and basic, according to the nature of the lining. By both methods the metal is purified by the removal of silicon, manganese, and carbon, but in the basic process most of the phosphorus and some of the sulphur is also removed. As the general nature of the equipment and the process is the same for both types except for this difference, the following description will merely note the main points in which the processes and equipment vary instead of describing each separately.

The modern open-hearth equipment is housed in a large building of fireproof construction usually having a structural-iron framework, heavily braced, with a sheathing of sheet iron or of corrugated iron. The open-hearth buildings connected with steel works seldom contain less than six or more than twelve separate furnaces, although there is one which has provisions for eighteen 60-ton furnaces under a single roof. This requires a building approximately a fourth of a mile in length. In steel foundries, on the other hand, the equipment consists usually of from one to four furnaces, and the building is proportionately small. The buildings are constructed with ventilators in the roof and with the sides well open to allow full access to the air. The type of building has been emphasized here because of the important effect of its design and construction on the conditions of work of the department. In the more recently constructed buildings in which attention has been given to this point much has been done to relieve the discomfort which arises from the presence of smoke and gas as well as from high temperatures.

The furnaces are placed side by side in a single row down the center of the building, with a space of 15 or 20 feet between them. In the modern plant the space in front of the furnaces, known as the "charging floor," is only a few feet below the furnace door, while the floor at the back of the furnace, known as the "casting pit," is some 20 feet below the level of the charging floor. In many of the older furnaces which are still operated both sides of the furnace are on the same level, a deep pit being dug behind each furnace to contain the ladle into which the steel is tapped from the furnace and the molds into which it is cast. In addition to making an extremely hot working place for the men engaged in tapping and casting, the pit can not be used in connection with the modern and highly economical method of casting the steel into ingot molds mounted on small cars drawn by a narrow-gauge locomotive.

The open-hearth furnace, as seen from the charging floor, consists of a strongly built steel framework and casing—inside which is built a shallow hearth of fire brick—lined with suitable refractory material for

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containing the bath of molten metal, and with a slightly arched roof of the same character and construction. The furnace is usually rectangular in plan, and at either end are square fire-brick flues, through which the preheated gas and air are brought to the hearth. Below the level of the furnace and usually running well back under the charging floor are the "regenerators," in which the gas and air are heated to a high temperature before being used in the furnace. The general plan of construction of these regenerators is similar to that already described for the "stoves" in the blast-furnace department, except that for economy of space the regenerators are horizontal instead of vertical. They consist of chambers of fire brick so set in checkerwork fashion as to leave small spaces between the bricks, through which the gas and air may take up the greatest amount of heat in their passage. During the operation of the furnace more or less slag, dirt, and dust are carried over with the outgoing gases. To intercept this and to provide an easy means of cleaning, small arched pockets, known as slag or dirt pockets, are provided at the bottom of each of the chambers. There are two of these chambers at each end of the furnace, one for gas and one for air. By an arrangement of valves operated from the furnace floor the gas and air are admitted alternately from each end of the furnace, the hot waste gases passing out through the flues on the other side of the regenerators to heat the checkerwork in the chamber before being allowed to escape into the air. The fresh gas and air entering through the red-hot chamber take up the heat, and, entering the furnace, unite to create a very high temperature above the hearth, which, with its bath of metal, is open to their action.

The most common type of furnace is stationary, and this form seems to be preferred in all modern furnaces except where some special process which requires draining a part of the slag during the process of melting is to be used. A number of furnaces, however, have been installed which are mounted on rockers, much like a cradle, and are provided with a massive hydraulic mechanism by which they can be tilted backward or forward to drain the slag or metal.

Although the general construction of the furnace is the same for both the "acid" and "basic" processes, the construction of the lining is different. In the acid furnace the lining is made by shoveling sand to a uniform depth of about one-half inch over the entire hearth, which is allowed to partially fuse, when another similar layer is put on. In the basic furnace the material, which consists of calcined dolomite (a magnesia limestone) mixed with a small amount of tarry composition as a binder, is set in place in the same way.

At the front of the furnace are the openings, usually three in number, through which the materials are put into the furnace. These openings, which are 3 or 4 feet wide, are closed by vertically sliding

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doors of fire brick set in a metal frame, or far better, by hollow metal doors, through which water circulates. Each of these sliding doors has a hole 2 or 3 inches in diameter, through which the condition of the metal can be inspected. At the back of the furnace a circular hole, similar to the blast-furnace "tapping hole," is made for draining the metal when it is ready to cast. In stationary furnaces the tapping hole is at the level of the bottom of the hearth and must be carefully stopped with refractory material during the process of melting, but in the tilting furnace it is above the level of the metal in the bath and can be used for running off the excess slag during the course of the process as well as for draining the metal by tilting the furnace to the proper angle. A spout is arranged underneath the tap hole by which the metal is led into the ladle. The charging floor is also extended for several feet behind the furnace in order to give a proper place from which to drill the tap hole and to put in the recarburizer.

On the charging floor in the large modern plants is a wide track for the "charging machine" (described below in connection with charging-machine operators) and a narrow-gauge track running directly in front of the furnace doors on which the smaller trucks loaded with "charging boxes" of material are brought to be put into the furnace. There is also in many plants a third rail in front of the furnace, forming a standard-guage track, on which the ladle of hot metal is brought in. There may be also standard and narrow gauge tracks and switches on the other parts of the floor, so that the entire floor is more or less a network of tracks, on which cars are constantly moving. Back of the charging-car tracks are usually large bins in which the fluxes and lining materials are kept.

The casting pit in the modern plant is a similar network of tracks, on which the cars carrying the ingot molds move into position and the ladle and cars for cinder and scrap are run.

Suspended on tracks bolted to the iron girders above the charging floor are one or more traveling cranes, of some 20 tons' capacity, for assisting in handling the materials and molten iron in charging, or at the "mixer" similar to that described for the Bessemer department. Above the casting pit are similar cranes of much larger capacity, ranging from some 40 to 150 tons, with perhaps a small crane for light work.

The process, so far as the present interest is concerned, is simple, consisting in charging iron or steel scrap or a combination of the two, together with some fluxing material and iron ore in basic practice, on the hearth, which has already been brought to a high temperature. In either the basic or acid process it requires about 4 hours for the metals to be completely melted, during which time there is little to do except to watch the process and reverse the gas and air, which is done every 15 or 20 minutes. After the metals are melted the reactions

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begin to take place, and frequent tests and inspections are made, and such materials added on the indications of the tests as are needed to produce the grade and kind of steel required. The acid process is much more rapid than the basic, and the metal is usually ready to tap about 8 or 9 hours after the materials have been charged. The basic process requires 2 or 3 hours longer. It is the usual practice to remove rather more of the carbon than is desired from the metal in melting and then to bring the carbon content up to the exact desired percentage by adding a carefully weighed amount of recarburizer in the furnace in the acid process or more generally in the ladle while the metal is being run, together with other elements in such proportion as are desired in the cast metal.

The metal is caught in a large ladle as it pours from the furnace and is then carried by a crane to the pouring platform, where it is poured through a hole in the bottom of the ladle into molds either mounted upon cars or set on the floor of the pit. The ingot molds are then removed from the ingots by an "ingot stripper" or by a crane of the usual kind. The former method, which is much more economical and requires less hard work, has already been described in connection with the Bessemer converters.

DESCRIPTION OF OCCUPATIONS.

In the following description of occupations the main occupation name shown represents the term retained in the report and under which data as to wages and hours of labor are presented. The names shown in parenthesis represent the most important minor occupations included under the name used in this report as well as other terms used in various plants to indicate the same class of work. In the first paragraph, "Duties," is given a description of the functions which employees in the occupation perform and the method by which the work is done. In the second paragraph, "Nature of work," two points are covered; first, an indication of the type of workmen required for the position, and, second, the conditions under which the work is done. The occupations are presented in the order of the processes of manufacture.

STOCKERS.

(Including Stock Unloaders; Box Hook Men.)

DUTIES.—Unload materials from cars and sort and assemble different grades of scrap in piles; but principal duty is to load the materials for open-hearth melting (limestone, scrap, pig iron, etc.) into the iron charging boxes. These boxes are about 4 feet long and are placed transversely on low, narrow-gauge flat cars and are then hauled to the front of the furnace. For some of the older furnaces charged by

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hand the stockers wheel the materials in barrows to the charging floor, where it is piled ready for use.

NATURE OF WORK.—Unskilled work, varying in difficulty and severity with the individual plant and foreman. For the greater part, however, the employees may be regarded as selected common labor. The work is much lighter under modern conditions than formerly, because all the hauling is done by locomotives, and nearly all the heavy materials, except limestone (dolomite) and other minerals and iron high in manganese, are handled with magnet cranes to a constantly increasing degree.

CHARGING-MACHINE OPERATORS.

(Including Charging-machine Men.)

DUTIES.—Operate the machine for charging materials into the furnace and for placing and removing the runner for pouring hot metal. The usual type of machine consists of an electrically-propelled truck, moving on a track parallel with the furnace fronts, on which truck is mounted an electric carriage, moving to and from the furnaces. A large bar or ram projects on the furnace side. This is provided with a specially shaped head, which engages in a groove at the end of the charging box. This bar can be moved back and forth, up and down, or made to revolve, so that with it the box is picked up, pushed through the open door of the furnace, and dumped. The machine is also used to shift the cars bearing the boxes to the point at which they will be used.

NATURE OF WORK.—Work requires considerable experience and much agility of mind and hand, because there are as many as five levers or handles, each of which controls some separate movement of the machine. Furthermore, since a number of men necessarily work on and around the track upon which the charging machine operates, constant watchfulness is demanded. The conditions under which the work is done vary both with the type of machine used and with the construction of the furnace building. Even under the best of conditions the heat is severe and the smoke and fumes from the furnaces and producers are bad, particularly during the summer months. The conditions are considerably relieved by frequent periods of rest, when no furnaces need charging. It should be noted also that even under the worst of conditions the charging-machine operator is much better situated than the hand chargers, described below.

CHARGERS, HAND.

DUTIES.—In the older plants, where no charging machines are used, introduce the materials for melting into the furnaces. In some plants this work is not specialized, but is performed by the melters' helpers.

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NATURE OF WORK.—The work is done by placing the materials on a peel, a long, heavy bar, flattened at one end to resemble a spade. This bar is rested on the sill of the furnace door, or on a roller at the front of the furnace, and then pushed to the proper point and dumped. The work is extremely heavy and the conditions of heat and smoke are, during the summer, well-nigh unbearable. The work is of course periodic, but none the less is extremely severe and exhausting.

DOOR OPERATORS.

(Including Door Boys; Pull Ups.)

DUTIES.—Operate levers which through electric or hydraulic connections open and close the doors of the furnace for charging or inspecting, or for making bottoms. In a few cases the doors are directly operated by pulleys or other means, which brings the operator alongside the furnace and consequently in a position which is uncomfortably hot in summer. Frequently act as messengers and water boys.

NATURE OF WORK.—The work is light and is frequently performed by boys. There is a great deal of leisure time, when no work is required.

MELTERS.

(Including Melting Foremen; Furnace Foremen.)

DUTIES.—In direct charge (usually under the direction of a superintendent and his assistant) of the operation of a group of furnaces or of the entire department. Where the furnaces exceed six or eight in number, they are divided into groups, with a senior melter in charge of the building, and a junior melter in charge of each group. It is upon the melter's orders, as determined by inspection, fracture tests, and chemical tests, that the furnaces are tapped or proper additions of materials made, and upon his orders that original charges are proportioned. Also oversees the repairing or rebuilding of the furnaces under his charge.

NATURE OF WORK.—The position requires a great deal of practical metallurgical knowledge, which must be exercised with much judgment. Since a great deal of this knowledge can be acquired only by long experience, the position is usually filled from among the first helpers. In many plants the position carries much of the authority and responsibility of a superintendent. All members of charging and of melting crews are under his direction.

MELTERS' HELPERS, FIRST.

(Including First Helpers; Second Melters; Assistant Melters; First Heaters; Furnace Men, First.)

DUTIES.—In direct charge, under the melter's orders, of the operation of a single furnace. The duties fall into groups: (1) Directing the charging of materials as described above; (2) regulating the

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temperature of the furnace. The latter is done by reversing the gas and air in the regenerators at proper intervals (usually from 15 to 30 minutes, by regulating the flow of gas and air, and by charging cold or molten material, as the case may be); (3) inspecting and testing, particularly by fracture tests, and upon the melter's decision as to the indication of these tests, making the necessary additions of ore, flux, or recarburizer, as well as seeing that the melter's orders as to tapping are carried out; (4) "making bottoms" and repairing the walls and lining of the furnace. "Making bottoms" consists in distributing, with shovels or long handled "peels" or "spoons," dolomite or magnesite (basic furnaces) or sand (acid furnaces) at the point at which they are needed. These materials are fused by the heat of the furnace, and give a bottom smooth and impervious to the heated metal; (5) on Sundays, if the department operates only six days per week, "tending gas" and going over the furnaces for repairs more carefully than during the operating turns. "Tending gas" consists in maintaining the furnaces at an even temperature and is very light, easy work.

NATURE OF WORK.—The position requires considerable practical metallurgical knowledge (to be acquired only through experience) combined with a good deal of supervisory capacity, together with sufficient strength to stand a good deal of hard work. The work of making bottoms and repairs on linings is particularly hard, not only because it is heavy work, in which the first helper does his full share, but because working directly in front of the furnace door it is very hot work, especially in summer. Fortunately the work can be finished in from 15 to 30 minutes. In all the work assistance is furnished by the second helpers and the third helpers (cinder pitmen), and if necessary by men from other furnaces, this work being everywhere reciprocal. As the position leads almost directly to that of melter, it is eagerly sought after. The work is largely intermittent in character, the duties requiring from 50 to 80 per cent of the gross working time.

MELTERS' HELPERS, SECOND.

(Including Second Helpers; First Helpers; Furnace Men, second; Second Heaters.)

DUTIES.—Although in general assistants to the first helpers in most of their functions, the second helpers have specific charge of the back (casting side) of single furnaces, and assisted by the third helpers (or by other second helpers from other furnaces) perform the actual work of tapping. They drill out the magnesite clay with which the tapping holes are closed in stationary furnaces or signal the first helpers to tilt the furnaces if of the tilting type; with a bar keep the metal running freely and put in the recarburizer as the metal runs into the ladle; are everywhere employed in making bottoms and other necessary furnace repairs.

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NATURE OF WORK.—The position requires experience and skill, but no great amount of technical knowledge. The work is hard and heavy, and though the conditions under which it is done vary greatly, being much improved under the best modern conditions, these employees are still exposed to very high temperatures, though usually for short periods. The active working time is usually less than three-fourths of the normal working hours. The hazard of severe burns during the process of tapping is very considerable.

MELTERS' HELPERS, THIRD (CINDER PITMEN).

(Including Third Helpers; Cinder Pitmen; Slag Men; Furnace Men, third; Third Heaters; Laborers; Furnace Labor.)

DUTIES.—The organization and duties of this group differ rather widely in the various plants. For the majority, however, the duties may be said to consist in cleaning out the cinder pits and in cleaning up the slag, both in front of and behind the furnace; in helping to tap, and in shoveling the recarburizing materials which have been assembled at the back of the furnace into the ladles when the metal is run out. Also assist in "making bottoms," as described above. In many establishments (particularly the smaller ones) these duties are performed by the pit helpers or even the pitmen, described below, who in addition do other things and are therefore carried separately here.

NATURE OF WORK.—This is unskilled work and for the most part is not very heavy, although frequently considerable strength and endurance are called for. A great deal of the work is done under conditions of extreme heat; for example, "making bottoms," "tapping," and cleaning out cinder pits. In the modern plants where overflow ladles are arranged to catch most of the slag and where the recarburizer is put in by a chute the disagreeable and dangerous features are greatly reduced.

PITMEN.

(Including Brickers; Boot Knockers; Sledgers; Mold Men; Runner Makers; Mold Setters; Bottom Plate Men.)

DUTIES.—This term embraces a rather indefinite group of employees with the most widely varying duties or combinations of duties. In general pitmen may be said to comprise those who prepare the pit for casting, set the molds, build the runners, and sometimes even cap the molds and sledge out the ingots from the molds in place of the "stripping" described below. An outline of the exact duties in each plant was obtained and an attempt was made to separate them into definite occupations, but such a widely varying and overlapping list of functions was shown that the best that could be done

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was to place those who had to do with the preparation of the molds and the pit in general in one group and those who had to do with the pouring and care of the ladles (ladle men, etc.) in another. Then from the latter group (ladle men) the most important and highly skilled occupations were taken out wherever the duties were clear and distinct.

NATURE OF WORK.—In general the work is not highly skilled, though some of it (e. g., the preparation of runners and molds for bottom-poured ingots) requires great care and a good deal of experience. On the other hand, while some of it is light, a great deal of it, particularly the sledging off of molds, is extremely heavy, hot work. The rates will, therefore, be found to vary greatly, even in the same establishment. The position carries with it special hazards, due to falling objects from the overhead cranes, explosions of hot metal, the overturning of molds or ladles of hot metal, and more rarely break-outs of the furnace.

PIT HELPERS.

(Including Pit Clean Ups; Cinder Men, casting; Slag Men, casting; Mold Cleaners; Car Pushers; Brick Wheelers; Pit Labor.)

DUTIES.—This term embraces chiefly those employees of little more than "common labor" grade, who bring and remove materials used by the pitmen, clean up the pit, clean and help prepare the molds for casting, and in general act as helpers to the pitmen.

NATURE OF WORK.—The work is unskilled for the most part and requires little experience. The employees are subject to the same general conditions of work and hazard as the pitmen.

STEEL POURERS, STOPPER SETTERS, MOLD CAPPERS, LADLE LINERS.

DUTIES.—See same names in Bessemer converters for description. The work is similar and the conditions are practically the same except that much larger quantities of metal are handled at one time in the open hearth, and the ingots in the Bessemer are always cast in molds mounted on small cars, which is the usual method in open hearths connected with steel works, though the largest ingots and all the casting in many of the older plants and in the steel foundries is done in stationary molds in pits.

NATURE OF WORK.—The work in all the occupations under the old method of "pit casting" is much more severe and hazardous than under the best arranged modern system of car casting, where the molds are brought in succession in front of the steel pourer's stand to be filled and capped. Where pits are used and a number of ingots cast at one time it is frequently necessary for the mold capper to climb out on top of the molds full of molten metal. The fact that larger amounts of metal are handled in the open hearth does not

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affect the temperature to any considerable extent, and indeed the conditions are usually much better in the modern open hearth than in the Bessemer department for this division of the work.

LADLE MEN; LADLE MEN'S HELPERS.

(Including Casting Men; Platform Men; Mold Markers; Nozzle Setters, and other occupations noted under Stopper Setters, Steel Pourers, and Mold Cappers.)

DUTIES.—These two classes include the employees who perform various combinations of the duties of casting, as indicated above under pitmen. In the smaller plants the work is not specialized, one man with his helpers usually performing the entire work of the stopper setter, steel pourer, stopper maker, mold capper, and ladle liner, as well as in some cases also those of the pitmen described. This work is the least standardized in the entire industry.

NATURE OF WORK.—All the principal work of casting requires considerable practical technical knowledge and experience. Little of the work in the modern plants is heavy and the conditions of heat and danger are being constantly improved. The wide variations in rates shown depend not only upon the peculiar combinations of duties described, but also upon the size and the product of the particular plant.

INGOT STRIPPER.

See Bessemer converters.

CRANEMEN.

(Including Crane Boys; Crane Operators; Cranemen, ladle; Cranemen, pit; Cranemen, stock; Cranemen, charging; Cranemen, floor; Cranemen, gable; Cranemen, ingot yard; Cranemen, scrap drop; Cranemen, mixing house; Cranemen, mixers; Cranemen, magnet, etc.)

DUTIES.—Operate the many and highly diversified cranes used in and around the open hearth for handling ladles, slag and cinder, stock, metal, etc. These cranes vary in size from 5 to 100 tons' capacity, and may be electric, electrohydraulic, or hydraulic in type. As a rule, however, they are overhead electric cranes of 25 to 60 tons' capacity, the larger number being in use over the pit at the back of the furnace to handle the ladles of molten metal and to assist in cleaning up.

NATURE OF WORK.—As indicated, the work varies in skill and experience required on account of the many types and sizes of cranes in use, and the functions which they perform. Handling, as they do, chiefly ladles of molten metal, a great deal of the work is done under conditions of extreme heat, This, however, together with the hazard of the occupation, is greatly relieved in many plants by various methods described elsewhere. A great deal of the work is performed by lads of 16 to 20 years of age, as their quickness of mind

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and body are great factors in learning and in successfully performing the operation of the cranes. Many of the cranemen are electricians and make their own repairs.

ENGINEERS, STATIONARY.

DUTIES.—Operate the small stationary engines used for hoisting, grinding, etc.

NATURE OF WORK.—Practically all this work is of a low grade and requires little skill or experience.

LABORERS.

(Including Ash Men; Ash Wheelers; Cinder Dump Men; Clean Ups; Coal Passers; Door and Spout Liners' Helpers; Grinding Laborers; Mixer Laborers; Mixing-house Laborers; Stopper Makers' Helpers; Yardmen; etc.)

DUTIES.—Includes all the large number of unskilled and unspecialized work of the department, as well as in a number of plants such employees as melters' helpers, third; ladle cleaners, etc., which are ordinarily given separate occupation names, although paid but little above the common labor rate.

NATURE OF WORK.—The work varies widely in difficulty and experience required, although in most plants it is paid at a single hourly rate. The work is all unskilled, and as the work is chiefly done by non-English speaking men, the orders are communicated by the foreman almost entirely in a really remarkable sign language, unintelligible to an outsider. It is proper to remark at this point that although the unskilled positions directly connected with production (the "turn workers") are paid little if any more than the rate for "common labor," the positions are much more highly valued and sought after, even though the work is harder, because employment is insured every day the department is in operation.

UNCLASSIFIED.

DUTIES.—This includes a great number of miscellaneous occupations required by local conditions, in addition to several which are of some importance but which are not standardized, and were, for the most part, not reported separately. Among these occupations are: (*a*) Mixer men, who tend the large vessels in which several hundred tons of molten metal from the blast furnaces may be kept at a uniform temperature until required. These vessels are usually more or less hemispherical in shape and are made of steel plates lined with refractory material. They are pivoted so that the necessary amount of metal may be poured and the accumulations of slag be easily removed. They are a large factor in making it possible to do away with Sunday work in the open-hearth and Bessemer departments. The work is usually divided among a subforeman, who has general charge; a

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lever man, who controls the hydraulic mechanism by which the mixer is tilted; and one or more slag men, who skim off the slag on top of the molten metal. Means are ordinarily provided for heating the metal in the mixer with gas or oil, and when it is necessary to use this heat one or the other of the men regulates it. (*b*) Mixing-house men, who crush and grind the refractory material used in lining and patching ladles, furnaces, etc. This is chiefly unskilled work and consists largely in shoveling materials into the grinder (much like a primitive gristmill, with two vertical iron wheels which revolve against a lower horizontal wheel) and in removing them. (*c*) Cranemen's helpers, who signal the cranemen and hook the crane chains to the various things to be removed. Usually paid a little above common labor, as some little intelligence is required in giving the cranemen proper signals and in getting the chain fastened securely. (*d*) Chasers, who see that tools and materials needed are in proper place, and that ingots, etc., are shipped properly. The work varies considerably in proportion to the responsibility and nature of the duties imposed. Chiefly done by lads under 20 years of age.

NATURE OF WORK.—As indicated by the rates, the class of work done varies widely. All the boys employed who have not a specialized occupation, such as door operators, are included here, and include all those whose rates fall below 12 cents an hour, except in the Southern district.

EARNINGS AND HOURS AND DAYS OF WORK, BY OCCUPATIONS.

EARNINGS PER HOUR.

Data relative to earnings per hour for each occupation and each plant are shown in detail in Table I, Volume II, and for each occupation and each district in Table II. Table I shows for each plant separately customary number of working days per week, customary number of working hours per day, normal number of employees, average earnings per hour, and number of employees earning each classified amount per hour. Table II shows for each occupation and each district the number of plants reporting data, the number of employees included, and the average earnings per hour. The table is so arranged that a comparison is easily made of the earnings of time workers and of tonnage workers in the different occupations within each of the districts and also of the earnings of each of the two classes of workers in the several districts.

The tables here presented summarize the information concerning earnings. The table which follows is a summary of Table II, with the exception that time workers and tonnage workers are not shown separately but are combined. The table is so arranged that a comparison is easily made of the earnings of any occupation in all of the districts, and also a comparison of the earnings of the various occupa-

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tions within a district. The data are shown only for the principal districts, as the number of employees in the other districts, as has already been noted, is too small to admit of comparison.

AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY DISTRICTS—OPEN-HEARTH FURNACES.

Occupations.	New England district.	Eastern district	Pittsburgh district.	Great Lakes and Middle West district.	Southern district.	Total, all districts.
Chargers:						
Plants	.....	4	2	1	.....	7
Employees	.....	64	16	12	.....	92
Average earnings per hour.....cents.	.....	20.2	17.3	17.5	.....	19.3
Charging machine operators:						
Plants	2	8	19	13	4	46
Employees	6	32	100	59	13	210
Average earnings per hour.....cents.	20.3	21.1	29.8	31.4	25.2	28.5
Cranemen:						
Plants	3	13	24	13	4	57
Employees	16	183	443	216	19	877
Average earnings per hour.....cents.	20.7	21.2	24.0	25.1	26.7	23.8
Door operators:						
Plants	2	7	22	15	3	49
Employees	6	79	251	118	15	469
Average earnings per hour.....cents.	15.6	8.9	10.0	10.7	9.0	10.1
Engineers, stationary:						
Plants	2	4	3	5	1	15
Employees	4	13	7	8	1	33
Average earnings per hour.....cents.	24.2	16.6	21.7	24.8	25.0	20.8
Ingot strippers:						
Plants	1	4	13	8	3	29
Employees	2	18	44	24	6	94
Average earnings per hour.....cents.	21.0	22.8	27.6	25.2	24.4	25.7
Laborers:						
Plants	2	16	25	17	4	64
Employees	19	723	1,664	853	113	3,372
Average earnings per hour.....cents.	16.3	13.7	16.6	16.6	13.4	16.0
Ladle liners:						
Plants	.....	1	10	5	2	18
Employees	.....	4	26	9	4	43
Average earnings per hour.....cents.	.....	19.5	31.3	28.5	45.1	30.3
Ladle men:						
Plants	3	20	24	16	2	65
Employees	6	85	68	33	4	196
Average earnings per hour.....cents.	35.6	25.8	28.2	32.2	40.9	28.5
Ladle men, helpers:						
Plants	3	15	23	19	4	64
Employees	6	104	230	113	47	500
Average earnings per hour.....cents.	21.8	17.5	23.5	21.6	17.3	21.4
Melters:						
Plants	2	18	26	14	3	63
Employees	6	61	107	41	5	220
Average earnings per hour.....cents.	60.1	48.4	67.8	65.1	42.7	61.6
Melters' helpers, first:						
Plants	3	19	32	20	5	79
Employees	12	185	531	257	46	1,031
Average earnings per hour.....cents.	35.5	30.7	40.0	40.5	41.3	38.5
Melters' helpers, second:						
Plants	3	17	31	20	4	75
Employees	14	198	524	280	37	1,053
Average earnings per hour.....cents.	27.1	21.8	27.4	26.5	21.7	24.8
Melters' helpers, third:						
Plants	2	9	24	12	4	51
Employees	8	92	534	271	48	953
Average earnings per hour.....cents.	20.6	17.4	20.9	19.3	18.2	20.1
Mold cappers:						
Plants	.....	.....	6	2	.....	8
Employees	.....	.....	62	10	.....	72
Average earnings per hour.....cents.	.....	.....	25.0	22.0	.....	24.6
Pitmen:						
Plants	2	14	22	8	3	49
Employees	4	225	219	38	26	512
Average earnings per hour.....cents.	24.2	21.8	21.9	25.3	14.5	21.7
Pit helpers:						
Plants	2	9	7	7	.....	25
Employees	14	115	99	71	.....	299
Average earnings per hour.....cents.	18.2	16.5	17.5	18.3	.....	17.4

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AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY DISTRICTS—OPEN-HEARTH FURNACES—Concluded.

Occupations.	New England district.	Eastern district.	Pittsburgh district.	Great Lakes and Middle West district.	Southern district.	Total, all districts.
Steel pourers:						
Plants	.....	.....	10	5	2	17
Employees	.....	.....	54	20	7	81
Average earnings per hour.....cents	.....	.....	33.6	34.1	28.5	33.4
Stockers:						
Plants	3	16	29	15	3	66
Employees	72	379	746	386	62	1,645
Average earnings per hour.....cents	17.6	15.4	18.5	17.5	15.1	17.5
Stopper setters:						
Plants	.....	.....	8	3	2	13
Employees	.....	.....	48	11	4	63
Average earnings per hour.....cents	.....	.....	31.9	35.8	27.9	32.4
Unclassified:						
Plants	2	10	22	14	2	50
Employees	9	160	257	161	19	606
Average earnings per hour.....cents	17.8	19.4	19.7	19.3	18.3	19.4

Approximately 95 per cent of all the employees and 72 of the 80 plants are in the Eastern, the Pittsburgh, and the Great Lakes and Middle West districts. The average earnings are 1 cent an hour lower in the Great Lakes and Middle West district than in the Pittsburgh district, and the average earnings in the Eastern district are 2.9 cents lower than in the Great Lakes and Middle West district. It is possible to compare the earnings in the three principal districts in 18 of the above occupation classifications. The earnings by occupations are approximately the same in the Pittsburgh district and the Great Lakes and Middle West district, but in 16 of the 18 occupation classifications the average earnings in the Eastern district are lower than in either of the other districts.

The next table compares the earnings of time workers and tonnage workers. In every occupation the tonnage workers receive higher average earnings than do the time workers. This difference is especially marked in certain occupations, such, for instance, as the melters, where the 79 employees paid on the time basis average 50.7 cents per hour and the 141 employees paid on the tonnage basis 67 cents per hour, and in the occupation of pitmen, where the 211 employees in that occupation paid on the time basis averaged 18.5 cents per hour and the 301 employees paid on the tonnage basis 24 cents per hour.

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COMPARISON OF AVERAGE EARNINGS PER HOUR OF TIME WORKERS AND OF TONNAGE WORKERS, BY OCCUPATIONS—OPEN-HEARTH FURNACES.

Occupations.	Time.			Tonnage.			Time and tonnage combined.		
	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.
Chargers	6	70	$0.180	1	22	$0.229	7	92	$0.193
Charging-machine operators	22	67	.242	26	143	.303	46	210	.285
Cranemen	52	473	.216	29	404	.261	67	877	.238
Door operators	46	434	.099	3	35	.130	49	469	.101
Engineers, stationary	15	33	.208				15	33	.208
Ingot strippers	16	34	.228	16	60	.274	29	94	.258
Laborers	64	3,372	.160				64	3,372	.160
Ladle liners	10	23	.265	8	20	.346	18	43	.303
Ladle men	46	113	.283	20	83	.286	65	196	.285
Ladle men's helpers	56	223	.181	26	277	.238	64	500	.214
Melters	36	79	.507	30	141	.670	63	220	.616
Melters' helpers, first	48	259	.325	38	772	.403	79	1,031	.385
Melters' helpers, second	45	335	.222	35	718	.275	75	1,053	.248
Melters' helpers, third	32	343	.175	25	610	.212	51	953	.201
Mold cappers	2	10	.215	7	62	.251	8	72	.246
Pitmen	29	211	.185	24	301	.240	49	512	.217
Pit helpers	15	114	.164	12	185	.180	25	299	.174
Steel pourers	3	8	.326	15	73	.335	17	81	.334
Stockers	54	1,246	.163	15	399	.268	66	1,645	.175
Stopper setters	3	7	.263	11	56	.333	13	63	.324
Unclassified	50	393	.183	18	213	.214	50	606	.194

The next table shows for each of the principal occupations the average earnings per hour and the per cent of employees earning each classified amount per hour. The occupations are in order following the processes of manufacture.

PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS—OPEN-HEARTH FURNACES.

Occupations.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.										
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Stockers	66	1,645	$0.175	.....	8.63	20.18	37.75	11.91	20.85	0.61	0.06	.....	.....	.....	.....
Charging side of furnace:															
Melters	63	220	.616	.....	.....	.....	.....	.....	.....	1.36	5.91	21.82	20.00	16.36	34.55
Melters' helpers, first	79	1,031	.385	.....	.....	.....	.....	.39	2.04	9.41	44.13	39.77	4.27	.....	.....
Melters' helpers, second	75	1,053	.248	.....	.....	.38	3.32	8.36	28.49	44.16	15.29	.....	.....	.....	.....
Melters' helpers, third	51	953	.201	.....	.....	3.88	34.94	16.58	41.24	.42	2.94	.....	.....	.....	.....
Charging-machine operators	46	210	.285	.....	.....	1.90	3.81	2.86	18.10	24.76	45.71	2.86	.....	.....	.....
Pouring side of furnace:															
Pitmen	49	512	.217	.....	.....	7.03	17.19	12.89	38.28	19.14	5.27	.20	.....	.....	.....
Pit helpers	25	299	.174	2.68	8.03	12.04	52.51	8.70	16.05	.....	.....	.....	.....	.....	.....
Steel pourers	17	81	.334	.....	.....	.....	.....	.....	.....	30.86	44.44	24.69	.....	.....	.....
Stopper setters	13	63	.324	.....	.....	.....	.....	.....	20.63	.....	63.49	12.70	3.17	.....	.....
Ladle men	65	196	.285	.....	.....	.....	4.08	3.06	20.41	29.59	35.20	7.65	.....	.....	.....
Ladle men's helpers	64	500	.214	.....	4.40	9.00	17.80	13.00	32.80	18.40	4.20	.40	.....	.....	.....
Ingot strippers	29	94	.258	.....	.....	.....	2.13	4.26	42.55	34.04	17.02	.....	.....	.....	.....
Cranemen	57	877	.238	.....	.80	.46	8.89	12.66	41.62	18.13	16.53	.91	.....	.....	.....
Laborers	64	3,372	.160	.18	19.16	17.56	60.74	2.37	.....	.....	.....	.....	.....	.....	.....
Other occupations	.....	1,315	.167	31.71	1.98	9.73	16.27	13.31	17.87	5.25	2.59	.84	.46	.....	.....
Total, all occupations	80	12,421	.219	3.47	6.98	9.81	29.64	7.93	17.68	9.37	9.19	4.26	.76	.31	.61

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The next summary shows for each of the districts the number of plants reporting, the normal number of employees, average earnings per hour, and number of employees earning each classified amount per hour. Time workers and tonnage workers are shown separately, and the two classes are also combined.

NUMBER OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS, BY DISTRICTS—OPEN-HEARTH FURNACES.

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Number of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
TIME WORKERS.															
New England	3	180	$0.216	.....	2	53	37	7	47	10	12	6	4	.....	2
Eastern	20	1,822	.164	82	586	527	201	98	170	91	46	8	9	1	3
Pittsburgh	32	3,335	.178	234	131	269	1,841	302	337	102	81	25	8	1	4
Great Lakes and Middle West	20	2,174	.180	84	14	254	1,198	120	262	86	128	19	5	3	1
Southern	5	336	.177	6	126	61	59	16	27	9	22	6	4	.....	.....
Total, all districts	80	7,847	.177	406	859	1,164	3,336	543	843	298	289	64	30	5	10
TONNAGE WORKERS.															
New England	1	24	.256	.....	.....	.....	.....	4	6	12	2	.....	.....	.....	.....
Eastern	9	898	.241	8	8	16	149	126	279	172	102	22	10	6	.....
Pittsburgh	21	2,695	.292	8	.....	38	160	206	813	534	544	304	18	21	49
Great Lakes and Middle West	14	817	.310	.....	.....	.....	17	100	211	119	201	110	36	6	17
Southern	2	140	.277	9	.....	.....	19	6	44	29	4	29	.....	.....	.....
Total, all districts	47	4,574	.286	25	8	54	345	442	1,353	866	853	465	64	33	66
TIME AND TONNAGE WORKERS.															
New England	3	204	.221	.....	2	53	37	11	53	22	14	6	4	.....	2
Eastern	20	2,720	.191	90	594	543	350	224	449	263	148	30	19	7	3
Pittsburgh	32	6,030	.230	242	131	307	2,001	508	1,150	636	625	329	26	22	53
Great Lakes and Middle West	20	2,991	.220	84	14	254	1,215	220	473	205	329	129	41	9	18
Southern	5	476	.196	15	126	61	78	22	71	38	26	35	4	.....	.....
Total, all districts	80	12,421	.219	431	867	1,218	3,681	985	2,196	1,164	1,142	529	94	38	76

The average hourly earnings for the 12,421 employees was 21.9 cents. The average earnings for the 7,847 employees paid on the time basis was 17.7 cents, and for the 4,574 employees on the tonnage basis 28.6 per hour. This marked difference between earnings of time and tonnage workers is due, in part, to the fact that a larger proportion of the tonnage workers than of the time workers are skilled employees. It is also true, however, as has been noted on a preceding page, that in every occupation the tonnage workers receive a higher average earning than do the time workers. The lowest rate reported was 10 cents per hour, and employees were paid that rate in four of the five districts. The highest rate was in the class $1.25

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and over and was paid in only one district. Only 15.12 per cent of all employees, however, received 30 cents and more per hour, while 20.26 per cent of all employees received less than 16 cents per hour, and 49.90 per cent of all employees received less than 18 cents per hour.

The table which follows shows the per cent of employees earning each classified amount per hour. These percentages are computed from the third section of the table immediately preceding. Time workers and tonnage workers are combined.

PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS, BY DISTRICTS—OPEN-HEARTH FURNACES.

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
New England	3	204	$0.221	.....	0.98	25.98	18.14	5.39	25.98	10.78	6.86	2.94	1.96	.....	0.98
Eastern	20	2,720	.191	3.31	21.84	19.96	12.87	8.24	16.51	9.67	5.44	1.10	.70	0.26	.11
Pittsburgh	32	6,030	.230	4.01	2.17	5.09	33.18	8.42	19.07	10.55	10.36	5.46	.43	.36	.88
Great Lakes and Middle West	20	2,991	.220	2.81	.47	8.49	40.62	7.36	15.81	6.85	11.00	4.31	1.37	.30	.60
Southern	5	476	.196	3.15	26.47	12.82	16.39	4.62	14.92	7.98	5.46	7.35	.84	.....	.....
Total, all districts	80	12,421	.219	3.47	6.98	9.81	29.64	7.93	17.68	9.37	9.19	4.26	.76	.31	.61

From the above table it is seen that the largest group of employees, 29.64 per cent, earn 16 and under 18 cents per hour. The second largest group, 17.68 per cent, earned 20 and under 25 cents per hour, and the third largest group, 9.81 per cent, 14 and under 16 cents per hour.

The summary in the form of cumulative percentages which follows shows that 20.26 per cent of all employees earned less than 16 cents, 49.90 per cent earned less than 18 cents, and 75.51 per cent earned less than 25 cents per hour. Only 15.12 per cent earned as much as 30 cents per hour, although the employees in this department include the melters, who are in general charge of operations of the department, and such employees as steel borers, who are among the most skilled in the entire industry.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR—OPEN-HEARTH FURNACES.

Earnings per hour.	Number of employees.	Per cent of total number of employees.	Earnings per hour.	Number of employees.	Per cent of total number of employees.
Under 14 cents	1,298	10.45	Under 25 cents	9,378	75.51
Under 16 cents	2,516	20.26	Under 30 cents	10,542	84.88
Under 18 cents	6,197	49.90	Under 40 cents	11,684	94.07
Under 20 cents	7,182	57.83	Under 50 cents	12,213	98.33

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The per cent of employees earning each classified amount per hour in each of the districts is shown by means of cumulative percentages in the table which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—OPEN-HEARTH FURNACES.

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning per hour—							
			Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	204	$0.221	0.98	26.96	45.10	50.49	76.47	87.25	94.11	97.05
Eastern	2,720	.191	25.15	45.11	57.98	66.22	82.73	92.40	97.84	98.94
Pittsburgh	6,030	.230	6.19	11.28	44.46	52.88	71.95	82.50	92.86	98.32
Great Lakes and Middle West	2,991	.220	3.28	11.77	52.39	59.75	75.56	82.41	93.41	97.72
Southern	476	.196	29.62	42.44	58.83	63.45	78.37	86.35	91.81	99.16
Total, all districts	12,421	.219	10.45	20.26	49.90	57.83	75.51	84.88	94.07	98.33

The above comparison shows that the earnings were under 14 cents for 29.62 per cent of the 476 employees in the Southern district, 25.15 per cent of the 2,720 employees in the Eastern district, 6.19 per cent of the 6,030 employees in the Pittsburgh district, 3.28 per cent of the 2,991 employees in the Great Lakes and Middle West district, and 0.98 per cent of the 204 employees in the New England district.

The earnings were under 18 cents per hour for 58.83 per cent of the employees in the Southern district, 57.98 per cent of the employees in the Eastern district, 52.39 per cent of the employees in the Great Lakes and Middle West district, 45.10 per cent of the employees in the New England district, and 44.46 per cent of the employees in the Pittsburgh district.

One further point may be deduced from these tables. The rates under 18 cents per hour for the New England, the Pittsburgh, and the Great Lakes and Middle West districts, and the rates under 16 cents per hour for the Eastern and Southern districts represent the wages at which only boys and unskilled workmen can be employed. It may, therefore, be said that in the New England, Eastern, and Pittsburgh districts approximately 45 per cent of the total employees in the open-hearth department, in the Great Lakes and Middle West district 52 per cent, and in the Southern district 42 per cent were unskilled laborers or boys.

Considering all employees, both time and piece, the average earnings were lowest in the Eastern district, slightly higher in the Southern district, and highest in the Pittsburgh district. The New England district and the Great Lakes and Middle West district are practically the same and only slightly below the Pittsburgh district.

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CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working hours per week are presented in detail for each occupation and each plant in Table I, Volume II of this report. These data are summarized in the text tables which follow. The first of these tables shows for each occupation the number of plants reporting, the normal number of employees, the average customary working hours per week, and the number of employees whose customary working time was each classified number of hours per week.

NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK—OPEN-HEARTH FURNACES.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Chargers	7	92	69.2	.....	.....	.....	27	32	.....	33	.....	.....
Charging-machine operators	46	210	76.4	.....	.....	.....	.....	23	66	77	44	.....
Cranemen	57	877	75.4	.....	2	18	22	94	243	313	184	1
Door operators	49	469	75.9	.....	.....	.....	8	50	154	145	112	.....
Engineers, stationary	15	33	73.1	.....	1	.....	1	9	10	8	2	2
Ingot strippers	29	94	74.0	.....	.....	.....	.....	18	46	20	10	.....
Laborers	64	3,372	73.1	.....	31	32	378	898	698	630	710	.....
Ladle liners	18	43	70.0	.....	2	.....	7	5	23	1	5	.....
Ladlemen	65	196	72.3	1	.....	1	25	41	42	63	23	.....
Ladlemen's helpers	64	500	74.2	.....	1	.....	25	56	200	143	75	.....
Melters	63	220	74.5	1	.....	.....	15	36	58	69	41	.....
Melters' helpers, first	79	1,031	76.6	3	.....	.....	16	116	225	426	238	7
Melters' helpers, second	75	1,053	75.5	.....	.....	.....	18	149	334	325	211	16
Melters' helpers, third	51	953	76.3	.....	.....	.....	7	54	370	308	214	.....
Mold cappers	8	72	74.9	.....	.....	.....	.....	2	38	28	4	.....
Pitmen	49	512	74.7	1	.....	.....	24	114	122	157	94	.....
Pit helpers	25	299	75.9	.....	.....	.....	8	62	82	38	109	.....
Steel pourers	17	81	75.0	.....	.....	.....	.....	2	47	22	10	.....
Stockers	66	1,645	74.0	5	8	73	116	244	325	508	275	1
Stopper setters	13	63	74.6	.....	.....	.....	.....	2	32	29	.....	.....
Unclassified	50	606	74.8	3	6	12	48	93	131	134	179	.....
Total, all occupations.	80	12,421	74.5	14	51	136	745	2,100	3,241	3,567	2,540	27

The table which follows shows for each of the principal occupations the per cent of employees working each classified number of hours. The occupations are in order following the processes of manufacture.

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PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK—OPEN-HEARTH FURNACES.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Stockers	66	1,645	74.0	0.30	0.49	4.44	7.05	14.83	19.76	36.35	16.72	0.06
Charging side of furnace:												
Melters	63	220	74.5	.45	.....	.....	6.82	16.36	26.36	31.36	18.64	.....
Melters' helpers, first	79	1,031	76.6	.29	.....	.....	1.55	11.25	21.82	41.32	23.08	.68
Melters' helpers, second	75	1,053	75.5	.....	.....	.....	1.71	14.15	31.72	30.86	20.04	1.52
Melters' helpers, third	51	953	76.3	.....	.....	.....	.73	5.67	38.82	32.32	22.46	.....
Charging machine operators	46	210	76.4	.....	.....	.....	.....	10.95	31.43	36.67	20.95	.....
Pouring side of furnace:												
Pitmen	49	512	74.7	.20	.....	.....	4.69	22.27	23.83	30.66	18.36	.....
Pit helpers	25	299	75.9	.....	.....	.....	2.68	20.74	27.42	12.71	36.45	.....
Steel pourers	17	81	75.0	.....	.....	.....	.....	2.47	58.02	27.16	12.35	.....
Stopper setters	13	63	74.6	.....	.....	.....	.....	3.17	50.79	46.03	.....	.....
Ladlemen	65	196	72.3	.51	.....	.51	12.76	20.92	21.43	32.14	11.73	.....
Ladle men's helpers	64	500	74.2	.....	.20	.....	5.00	11.20	40.00	28.60	15.00	.....
Ingot strippers	29	94	74.0	.....	.....	.....	.....	19.15	48.94	21.28	10.64	.....
Cranemen	57	877	75.4	.....	.23	2.05	2.51	10.72	27.71	35.69	20.98	.11
Laborers	64	3,372	72.9	.....	.92	.95	11.21	26.63	20.55	18.68	21.06	.....
Other occupations	.....	1,315	74.6	.....	.91	.91	6.92	14.52	27.07	26.54	22.97	.15
Total, all occupations	80	12,421	74.5	.11	.41	1.09	6.00	16.91	26.09	28.72	20.45	.22

The customary working hours were less than 60 per week for less than 2 per cent of all employees in the open-hearth furnaces.

The per cent of employees customarily working 72 hours and over and the per cent customarily working 84 hours and over in each of the principal occupations are shown in the table which follows. The percentages are in cumulative form, the employees working 84 hours and over being included with those working 72 hours and over. The occupations are given in the order of the processes of manufacture.

PER CENT OF EMPLOYEES IN THE PRINCIPAL OCCUPATIONS CUSTOMARILY WORKING 72 HOURS AND OVER PER WEEK—OPEN-HEARTH FURNACES.

Occupations.	Normal number of employees.	Per cent of employees whose customary working hours per week were—	
		72 and over.	84 and over.
Stockers	1,645	72.89	16.78
Charging side of furnace:			
Melters	220	76.36	18.64
Melters' helpers, first	1,031	86.90	23.76
Melters' helpers, second	1,053	84.14	21.56
Melters' helpers, third	953	93.60	22.46
Charging-machine operators	210	89.05	20.95
Pouring side of furnace:			
Pitmen	512	72.85	18.36
Pit helpers	299	76.58	36.45
Steel pourers	81	97.53	12.35
Stopper setters	63	96.82	.....
Ladle men	196	65.30	11.73
Ladle men's helpers	500	88.60	15.00
Ingot strippers	94	80.86	10.64
Cranemen	877	84.49	21.09
Laborers	3,372	60.29	21.06
Other occupations	1,315	76.73	23.12
Total, all occupations	12,421	75.48	20.67

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The next table is a summary showing the customary working hours per week, comparing five districts. Time workers and tonnage workers are shown separately.

NUMBER OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK, BY DISTRICTS—OPEN-HEARTH FURNACES.

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
TIME WORKERS.												
New England	3	180	63.8	.....	.....	54	41	75	.....	8	.....	2
Eastern	20	1,822	72.2	.....	34	31	149	774	113	239	480	2
Pittsburgh	32	3,335	74.1	11	4	27	147	802	806	1,080	451	7
Great Lakes and Middle West	20	2,174	74.7	.....	8	5	266	155	663	444	633	.....
Southern	5	336	78.6	.....	2	.....	16	2	72	77	167	.....
Total, all districts	80	7,847	73.8	11	48	117	619	1,808	1,654	1,848	1,731	11
TONNAGE WORKERS.												
New England	1	24	69.8	.....	.....	.....	.....	24	.....	.....	.....	.....
Eastern	9	898	72.9	.....	3	19	111	172	157	356	80	.....
Pittsburgh	21	2,695	76.8	.....	.....	.....	7	90	824	1,328	430	16
Great Lakes and Middle West	14	817	76.5	3	.....	.....	.....	6	478	35	295	.....
Southern	2	140	71.7	.....	.....	.....	8	.....	128	.....	4	.....
Total, all districts	47	4,574	75.8	3	3	19	126	292	1,587	1,719	809	16
TIME AND TONNAGE WORKERS.												
New England	3	204	64.5	.....	.....	54	41	99	.....	8	.....	2
Eastern	20	2,720	72.4	.....	37	50	260	946	270	595	560	2
Pittsburgh	32	6,030	75.3	11	4	27	154	892	1,630	2,408	881	23
Great Lakes and Middle West	20	2,991	75.2	3	8	5	266	161	1,141	479	928	.....
Southern	5	476	76.6	.....	2	.....	24	2	200	77	171	.....
Total, all districts	80	12,421	74.5	14	51	136	745	2,100	3,241	3,567	2,540	27

The customary working hours for the 7,847 time workers averaged 73.8 per week, and for the 4,574 tonnage workers 75.8 per week.

The table which follows shows for time workers and tonnage workers combined the per cent of employees customarily working each classified number of hours per week. The totals for the five districts are placed in comparison.

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PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK, BY DISTRICTS—OPEN-HEARTH FURNACES.

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent employees whose customary working hours per week were—								
				48.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	3	204	64.5	.....	.....	26.47	20.10	48.53	.....	3.92	.....	0.98
Eastern	20	2,720	72.4	.....	1.36	1.84	9.56	34.78	9.93	21.88	20.59	.07
Pittsburgh	32	6,039	75.3	0.18	.07	.45	2.55	14.79	27.03	39.93	14.61	.38
Great Lakes and Middle West	20	2,991	75.2	.10	.27	.17	8.89	5.38	38.15	16.01	31.03	.....
Southern	5	476	76.6	.....	.42	.....	5.04	.42	42.02	16.18	35.92	.....
Total, all districts.	80	12,421	74.5	.11	.41	1.09	6.00	16.91	26.09	28.72	20.45	.22

Of the three principal districts, the Great Lakes and Middle West district reported the largest proportion, 85.19 per cent, of all employees working at least 72 hours per week, which represents 12 hours per day for 6 days. The Pittsburgh district was next, with 81.95 per cent, and the Eastern district much lower, with 52.47 per cent, working at least 72 hours per week. Similarly of the three principal districts, the Great Lakes and Middle West reported the largest proportion, 31.03 per cent, working at least 84 hours per week, which means 7 days of at least 12 hours each; the Eastern district was the next lower with 20.66 per cent, while the Pittsburgh district was still lower, with 14.99 per cent.

The average customary working time per week for the total number of employees was 74.5 hours. Of all employees, 75.48 per cent worked 72 hours and over, and 20.67 per cent worked 84 hours and over.

DAYS WORKED PER WEEK.

Under each occupation the customary working days or turns per week are shown for each plant in Table I, Volume II of this report. These data are briefly summarized here. The table which follows shows for each occupation the number of plants reporting, the normal number of employees, and the number of employees whose customary working time was each specified number of days or turns per week:

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NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH SPECIFIED NUMBER OF DAYS PER WEEK—OPEN-HEARTH FURNACES.

Occupations.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Chargers	7	92	.....	.....	59	22	11
Charging-machine operators	46	210	.....	3	86	67	54
Cranemen	57	877	.....	40	[1] 321	297	219
Door operators	49	469	.....	14	216	120	119
Engineers, stationary	15	33	.....	.....	22	4	7
Ingot strippers	29	94	.....	.....	64	20	10
Laborers	64	3,372	.....	136	[2] 1,565	523	1,148
Ladle liners	18	43	.....	.....	33	.....	10
Ladle men	65	196	2	15	103	44	32
Ladle men's helpers	64	500	1	18	263	128	90
Melters	63	220	3	5	108	60	49
Melters' helpers, first	79	1,031	1	22	386	381	291
Melters' helpers, second	75	1,053	2	45	402	299	255
Melters' helpers, third	51	953	.....	15	416	309	222
Mold cappers	8	72	.....	.....	38	30	4
Pitmen	49	512	2	26	236	119	129
Pit helpers	25	299	.....	10	142	38	109
Steel pourers	17	81	.....	.....	47	24	10
Stockers	66	1,645	12	61	691	468	413
Stopper setters	13	63	.....	.....	32	30	1
Unclassified	50	606	.....	16	[3] 250	128	212
Total, all occupations	80	12,421	23	426	[4] 5,485	3,092	3,395

[1] Including 3 employees whose customary working time per week was 5 and 7 days.
[2] Including 16 employees whose customary working time per week was 5 and 7 days.
[3] Including 1 employee whose customary working time per week was 5 and 7 days.
[4] Including 20 employees whose customary working time per week was 5 and 7 days.

Six days or turns per week was the customary working time for 44.16 per cent of the 12,421 employees. Seven days or turns per week was the customary working time for 27.33 per cent of the total number of employees, and 6 and 7 days or turns per week, alternating, was the customary working time for 24.89 per cent, and 5 and 6 days or turns per week, alternating, for 3.43 per cent. Only 0.19 per cent worked 5 days or turns per week.

The table which follows shows for each of the principal occupations the proportion of employees customarily working each specified number of days or turns per week. The occupations are in order following the processes of manufacture.

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PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH SPECIFIED NUMBER OF DAYS PER WEEK—OPEN-HEARTH FURNACES.

Occupations.	Number of plants.	Normal number of employees.	Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Stockers	66	1,645	0.73	3.71	42.01	28.45	25.11
Charging side of furnace:							
Melters	63	220	1.36	2.27	46.82	27.27	22.27
Melters' helpers, first	79	1,031	.10	2.13	32.59	36.95	28.23
Melters' helpers, second	75	1,053	.19	4.27	43.87	27.45	24.22
Melters' helpers, third	51	953	.....	1.57	43.65	31.48	23.29
Charging machine operators	46	210	.....	1.43	40.95	31.90	25.71
Pouring side of furnace:							
Pitmen	49	512	.39	5.08	46.09	23.24	25.20
Pit helpers	25	299	.....	3.34	47.49	12.71	36.45
Steel pourers	17	81	.....	.....	58.02	29.63	12.35
Stopper setters	13	63	.....	.....	50.79	47.62	1.59
Ladle men	65	196	1.02	7.65	52.55	22.45	16.33
Ladle men's helpers	64	500	.20	3.60	52.60	25.60	18.00
Ingot strippers	29	94	.....	.....	68.09	21.28	10.64
Cranemen	57	877	.....	4.56	[1] 36.60	33.87	24.97
Laborers	64	3,372	.....	4.03	[2] 46.41	15.51	34.05
Other occupations	.....	1,315	.....	2.28	[3] 47.00	23.12	27.60
Total, all occupations	80	12,421	.19	3.43	[4] 44.16	24.89	27.33

[1] Including 3 employees whose customary working time per week was 5 and 7 days.
[2] Including 16 employees whose customary working time per week was 5 and 7 days.
[3] Including 1 employee whose customary working time per week was 5 and 7 days.
[4] Including 20 employees whose customary working time per week was 5 and 7 days.

Six days per week was the customary working time for 5,485 employees, or 44.16 per cent of the total; seven days or turns per week was the customary working time for 3,395 employees, or 27.33 per cent of the total; and 6 and 7 days or turns, alternating, was the customary working time for 3,092, or 24.89 per cent of the total. The facts that have been pointed out in the summary in the first part of this chapter with regard to seven-day work in the open-hearth department should be borne in mind here—first, the number shown here as working seven days does not include those employees who simply come out to tend gas on the furnaces every four or more Sundays; second, the number of seven-day workers does not include the gas men who are in charge of the gas producers and who are almost all seven-day workers; third, there is no metallurgical or technical necessity for any considerable amount of work to be done on Sunday, and the very large proportion reported above as working more than six days were in plants which were being operated every day in the week in order to increase output.

The table which follows shows for each of the principal districts the number and per cent of employees customarily working each specified number of days or turns per week:

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NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS PER WEEK, BY DISTRICTS—OPEN-HEARTH FURNACES.

Districts.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	3	204	.....	28	172	.....	4	.....	13.73	84.31	.....	1.96
Eastern	20	2,720	10	397	[1] 982	523	808	0.37	14.60	36.10	19.23	29.71
Pittsburgh	32	6,080	13	1	2,577	2,068	1,371	.22	.02	42.74	34.30	22.74
Great Lakes and Middle West	20	2,991	.....	.....	1,528	425	1,038	.....	.....	51.09	14.21	34.70
Southern	5	476	.....	.....	226	76	174	.....	.....	47.48	15.97	36.55
Total, all districts	80	12,421	23	426	[1] 5,485	3,092	3,395	.19	3.43	44.16	24.89	27.33

[1] Including 20 employees who worked alternately 5 and 7 days.

PUDDLING MILLS.

INTRODUCTION.

The data relative to earnings and hours of work are summarized briefly in the pages immediately following and analyzed in more detail on pages 117 to 129.

SUMMARY OF EARNINGS AND HOURS AND DAYS OF WORK.

EARNINGS.

Data relative to earnings in puddling mills were reported for 6,447 employees in special occupations in 47 plants. Of the total employees 51.45 per cent were in the Eastern district and 79.45 per cent in that district and the Pittsburgh district combined.

Of the 6,447 employees included in this report on puddling mills, 30.40 per cent earned 30 and under 40 cents per hour; 14.67 per cent earned 20 and under 25 cents per hour; 13.94 per cent earned 25 and under 30 cents; and 12.60 per cent earned 14 and under 16 cents per hour. The average earnings per hour for all employees were 27.4 cents. The average earnings were lowest in the New England district and, not considering the Pacific Coast district, highest in the Great Lakes and Middle West district. The earnings for the Pacific Coast district should not be used for comparative purposes, as only the more highly paid employees were reported for the plants in that district, the rest of the work being done on a contract basis, so that even approximate figures were not available.

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The distribution of the earnings in each of the separate districts is shown in the table which follows:

PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—PUDDLING MILLS.

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.								
			Under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 cents and over.
New England	609	$0.219	12.97	38.42	7.39	1.81	0.33	9.36	27.91	1.31	0.49
Eastern	[1]3,317	.264	[2]6.28	14.65	[3]6.66	5.70	19.48	13.57	25.87	2.53	5.28
Pittsburgh	1,805	.291	1.83	4.65	9.20	2.60	11.52	19.06	40.66	7.53	2.94
Great Lakes and Middle West	535	.322	.....	1.12	13.83	7.66	16.82	2.80	27.29	5.61	24.86
Southern	148	.262	.....	1.35	39.19	1.35	.....	20.27	33.78	.....	4.05
Pacific Coast	33	.698	.....	.....	.....	.....	.....	9.09	6.06	27.27	57.58
Total, all districts.	[1]6,447	.274	[2]4.96	12.60	[3]8.75	4.50	14.67	13.94	30.40	4.14	6.03

[1] Including 8 boys over 16 years of age.
[2] Including 6 boys over 16 years of age.
[3] Including 2 boys over 16 years of age.

The summary in the form of cumulative percentages which follows shows, however, that 26.31 per cent of all employees earned less than 18 cents per hour; 45.48 per cent earned less than 25 cents per hour; and 59.42 per cent earned less than 30 cents per hour. It may be noted that although 46.44 per cent of the 6,447 employees in this department are puddlers and bushelers, which is highly skilled work requiring the most severe physical exertion, only 6.03 per cent of the employees in all districts earn as much as 50 cents per hour, notwithstanding the high rates paid on the Pacific Coast.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—PUDDLING MILLS.

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning per hour—							
			Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	609	$0.219	12.97	51.39	58.78	60.59	60.92	70.28	98.19	99.50
Eastern	[1]3,317	.264	[2]6.28	20.93	[1]27.59	33.29	52.77	66.34	92.21	94.74
Pittsburgh	1,805	.291	1.83	6.48	15.68	18.28	29.80	48.86	89.52	97.05
Great Lakes and Middle West	535	.322	.....	1.12	14.95	22.61	39.43	42.23	69.52	75.13
Southern	148	.262	.....	1.35	40.54	41.89	41.89	62.16	95.94	95.94
Pacific Coast	33	.698	.....	.....	.....	.....	.....	9.09	15.15	42.42
Total, all districts	[1]6,447	.274	[2]4.96	17.56	[1]26.31	30.81	45.48	59.42	89.82	93.96

[1] Including 8 boys over 16 years of age.
[2] Including 6 boys over 16 years of age.

The above comparison shows that the earnings were under 18 cents per hour for 58.78 per cent of the 609 employees in the New England district, 40.54 per cent of the 148 employees in the Southern district, 27.59 per cent of the 3,317 employees in the Eastern district, 15.68 per cent of the 1,805 employees in the Pittsburgh district, and 14.95

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per cent of the 535 employees in the Great Lakes and Middle West district.

The earnings were under 30 cents per hour for 70.28 per cent of the employees in the New England district, 66.34 per cent of the employees in the Eastern district, 62.16 per cent of the employees in the Southern district, 48.86 per cent of the employees in the Pittsburgh district, and 42.23 per cent of the employees in the Great Lakes and Middle West district.

HOURS OF LABOR.

Customary working hours per full week were reported for 6,447 employees in special occupations in 47 plants. Of the total employees 62.22 per cent worked less than 56 hours per week, and 36.11 per cent worked 60 hours and over per week. These two groups represent, respectively, the skilled employees engaged in production, and the various unskilled and auxiliary employees engaged in assembling and handling materials. The hours are unusually low compared with the other departments of the industry.

The customary working hours per week, classified, for each district and for the total of all districts, are shown in the following table:

PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—PUDDLING MILLS.

Districts.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—				
			48 and under.	Over 48 and under 56.	56 and not over 60.	Over 60 and under 72.	72 and over.
New England	609	62.1	.....	0.82	29.89	68.97	0.33
Eastern	3,317	54.9	7.51	62.98	18.84	9.89	.78
Pittsburgh	1,805	54.7	32.19	28.14	4.93	32.85	1.88
Great Lakes and Middle West	535	53.1	37.94	36.45	10.28	13.83	1.50
Southern	148	47.9	74.32	25.68	.....	.....	.....
Pacific Coast	33	54.3	.....	100.00	.....	.....	.....
Total, all districts	6,447	55.2	17.73	44.49	14.75	21.96	1.09

In only two districts, the Eastern and the Pittsburgh, are any considerable number of employees represented. In those two districts the average hours per week were practically the same, 54.9 in the Eastern and 54.7 in the Pittsburgh district. The classified hours in those districts, however, show considerable variation. Of the employees in the Eastern district 81.82 per cent are in two groups, 62.98 per cent working over 48 and under 56 hours, and 18.84 per cent working 56 and not over 60 hours per week. In the Pittsburgh district the distribution was entirely different, there being three main groups, one 48 hours and under, including 32.19 per cent of the total, and one over 60 and under 72 hours, there being 32.85 per cent of the total reported in this group; the other main group in the Pittsburgh district includes 28.14 per cent of the total, whose work-

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ing hours are over 48 and under 56. In the Great Lakes and Middle West district the distribution very closely resembles that of the Pittsburgh district, while the New England district is noticeably higher than any of the others.

DAYS PER WEEK.

Of the employees in puddling mills 71.21 per cent were customarily employed for 6 days and 5 nights per week, alternately, there being 4,591 of the 6,447 employees in special iron and steel occupations reported in this group. The greater part of the remainder, 1,526 employees, representing 23.67 per cent of the total, were employed for 6 days or turns per week, there being only a small number in any of the other groups. These were distributed as follows: Five days or turns per week was the customary working time for 315 employees, or 4.89 per cent of the total; 8 employees worked 6 and 7 turns, alternately, and 7 employees worked 7 days or turns.

GENERAL DESCRIPTION OF EQUIPMENT AND METHOD OF OPERATION.

The puddling process is the method used in the production of wrought iron by oxidizing and removing most of the silicon, carbon, manganese, and phosphorus contained in pig iron, the operation being conducted in a reverberatory furnace.[1] The process has hardly changed in any essential in the past 50 years, and in a few plants the same equipment is being used which was installed half a century ago. It was thought by many a few years ago that steel would entirely supplant wrought iron for all practical purposes, but there is now a considerable and apparently increasing demand for wrought iron for boiler tubes and for other uses where the characteristic ease of welding of wrought iron is desirable. The puddling department is therefore of importance, not only because of its wide distribution but because of the large number of men employed.

The exterior appearance of a puddling furnace is very similar to that of the small coal-fired reheating furnaces used in bar mills. The furnace consists essentially of the hearth, on which the iron is melted; the grate, at one end of the furnace; and the stack, at the other end of the furnace, for carrying off the gases. There are many different types of puddling furnaces, varying in capacity from 300 to 1,500 pounds. They are, however, divided into two general classes—the "single" furnace, having only one working door, and the "double" furnace, which may be best described as two single furnaces placed back to back with the intervening rear walls removed. The double furnace is more economical in the use of fuel than the single furnace, but there is a large number of the single furnaces in use.

[1] For further discussion of reverberatory furnaces see p. 148.

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The hearth, which is usually 5 or 6 feet long and about 4 feet wide opposite the charging door, is built of cast-iron plates supported by brick walls or short iron pillars. This iron bottom is usually double, so that it can be cooled by the circulation of water between the plates. Resting upon and extending around the sides of the hearth is a water-cooled double wall of cast iron some 8 inches high, against which the lining of the hearth is banked as described below. At one end of the hearth is a grate upon which soft coal is burned, unless the furnace is gas heated. For coal this grate, which is made of iron bars separately removable for cleaning, has a surface of 6 to 10 square feet, so that a large amount of heat may be rapidly generated. Between the grate and the hearth is a fire-brick wall (bridge wall) high enough to prevent any fuel from passing over to the hearth or any slag or metal from falling on the fuel. At the other end of the hearth is a fire-brick chimney, about 2 feet square, for carrying off the flame and gases, which pass across the hearth from the grate and are deflected downward (reverberated) on the metal by the arched roof. This roof is about 2 feet high above the fireplace and gradually slopes down until it is less than a foot at the other end. At the chimney end of the hearth, the metal is prevented from running out by a second bridge known as the "altar." The bottom and sides of the hearth are lined with ore or slag rich in iron, which is set by heating to a high temperature. After the clay is drawn, the hearth, which is worn by every heat, is repaired (fettled) by throwing in the necessary amount of ore, slightly moistened, and specially prepared cinder. The opening through which the furnace is charged and worked is at one side of the furnace, opposite the center of the hearth, and is about 20 inches square. It is closed either by a panel of fire brick set in a metal casing, or, better, by a hollow metal door through which water circulates. This door is mounted so that it can be raised or lowered and has a small hole near the bottom through which the puddler can insert his tools and work the charge. This description applies to a single furnace of standard size (capacity 400 to 600 pounds). The double furnace, having a capacity of from 1,000 to 1,500 pounds, is essentially similar, except that the areas of hearth and grate are larger, though considerably less than double the size, and that two working doors instead of one are provided, on opposite sides

The equipment of the puddling mill includes in addition to the furnaces either a steam hammer or a drop hammer or a "squeezer" for working the puddle balls into rough blooms, and a stand of rolls for rolling the iron into rough bars, the product being known as "muck bar" or "puddled bar." The "squeezer" consists essentially of a cylinder, with teeth like those of a cog wheel, mounted on a vertical shaft and revolving inside a casing which is set eccentrically,

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one side being very much nearer the inner cylinder than the other. The ball is entered at the side where the distance between the cylinder and casing is greatest, the ball being gripped by the teeth and carried around between the two parts. As the ball reaches the narrower portion great pressure is exerted on it, so that the slag is squeezed out and the mass is forced into a rough elongated shape or "bloom." The rolls are similar to those used in bar mills and are operated in the same manner. For a description of the rolls, see pages 148 to 153.

After the charge has been drawn, the hearth lining is repaired or fettled, as described above, the puddler putting the large lumps of ore carefully into place with a long bar with a flattened end (the "peel") and covering them over with smaller lumps and fine ore, which are carefully smoothed into place. The pig iron, usually not more than 550 pounds for a single furnace, is then thrown into the furnace by the puddler and his helper, and the door tightly closed. The helper then fires vigorously in order that the melting or first stage in the process may be accomplished as rapidly as possible. During the 45 minutes usually occupied in melting little is done except to watch and occasionally turn over any pigs that show signs of sticking. When the fusion is complete, the bath is vigorously worked through the small hole in door with a hoe-shaped tool or "rabble" by the puddler and helper in order to expose the iron to the action of the flame and slag. Sometimes roll scale or high grade ore is added at this time in order to assure a very basic slag. The temperature is now considerably lowered, and the flame begins to attack the carbon, the reaction causing the evolution of carbon monoxide gas which bubbles up through the bath and causes this period, which lasts from 30 to 45 minutes, to be known as the "boil." During the boil the bath is puffed up several inches above its former level. The carbon monoxide, as it escapes, burns in pale blue jets of flame called "puddler's candles." During this period the puddler and his helper in turn have continued to "rabble" or work the bath, the slag which is formed running out in a thin stream into small buggies set in front of the door to catch it. As the carbon begins to be burned out the charge becomes more and more pasty, and at about this time grains of iron appear on the surface and the iron is said to have "come to nature." When this occurs the charge must be worked even more vigorously in order to insure the proper welding together of the particles. When the action is complete the now pasty mass of iron mixed with slag is broken up by the puddler into three or four balls weighing about 150 pounds each. The balls are rolled down near the fire bridge, so that they will keep hot and be protected from the direct action of the flame. The door is then raised and the balls are one by one seized with a pair of tongs and carried to the squeezer or hammer,

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where the ball is relieved of much of the slag and made into a rough bloom, which is then rolled down in the muck rolls.

The work of both the puddler and the helper is extremely heavy and exhausting on account of the high temperatures to which they are exposed. Various more or less successful mechanical puddlers have been devised, which would eliminate this hard work, but up to the present time practically all the wrought iron has been produced by hand.

DESCRIPTION OF OCCUPATIONS.

In the following description of occupations the main occupation name shown represents the term retained in the report and under which data as to wages and hours of labor are presented. The names shown in parenthesis represent the most important minor occupations included under the name used in this report as well as other terms used in various plants to indicate the same class of work. In the first paragraph, "Duties," is given a description of the functions which employees in the occupation perform and the method by which the work is done. In the second paragraph, "Nature of work," two points are covered; first, an indication of the type of workman required for the position, and, second, the conditions under which the work is done. The occupations are presented in the order of the processes of manufacture.

STOCKERS.

DUTIES.—Unload, pile, and deliver to the furnaces the pig iron, scrap, ore, and other materials used in puddling and busheling.

NATURE OF WORK.—Heavy work, requiring unskilled manual abor; largely done by contract.

PUDDLERS.

(Including Boilers.)

DUTIES.—Refine pig iron into wrought iron in a reverberatory furnace. The puddlers' work may be divided into five parts: First, lining the furnace with ore; second, charging the furnace; third, working the metal during the boil; fourth, working the iron into balls; fifth, drawing and delivering the balls to the squeezer. For a more detailed description of the duties, see the description of the process above.

NATURE OF WORK.—A highly-skilled occupation, requiring considerable experience, the puddler's work is perhaps the hardest physical labor in the industry, and, moreover, the largest part of it is done under conditions of extreme heat. The work is intermittent in character, there being a rest period between each of the periods of great exertion. The heat conditions are in many plants greatly moderated by the use of water-cooled furnace doors and fronts.

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PUDDLERS' HELPERS.

(Including Under Hands.)

DUTIES.—Assist the puddler in lining the furnace and in charging and working and drawing the metal. In addition they fire the furnace and watch the product and see that it is properly credited. Frequently two puddlers work the same furnace and divide the pay evenly. This is known as working "level-handed." In this case the two men make an equal division of all the duties.

NATURE OF WORK.—The position requires less skill and carries with it less responsibility than the position held by the puddler, as all the work is done under the puddler's direction. It is also not quite so severe, because the puddler does the greater portion of the "rabbling" or working of the metal during the boil and also makes the balls. The general conditions of work, however, are much the same as for the puddler.

BUSHELERS.

(Including Scrappers.)

DUTIES.—The duties are practically the same as those of the puddlers, except that iron scrap is charged in the furnace instead of pig iron and that each heat requires a shorter time.

NATURE OF WORK.—All conditions are practically identical with those of the puddler.

BUSHELERS' HELPERS.

(Including Scrappers' Helpers.)

Same general duties and conditions as described for puddlers' helpers.

CINDER MEN.

DUTIES.—Tap the cinder (slag) from the furnace and take care of all that runs out of the tap hole during the boil. This cinder is carefully preserved, as it contains a large percentage of iron.

NATURE OF WORK.—Hot, but not very heavy work. Comparatively unskilled.

SQUEEZER MEN.

DUTIES.—Tend the rotary squeezer by which the liquid slag is squeezed out of the balls and by which they are roughly shaped into a bloom for rolling. If the ball does not enter easily it is worked in gradually with a bar, and if the bloom does not come out easily from the squeezer, it is pried out with a bar. The work is performed in many plants by each puddler's helper in turn for the product of his own furnace.

NATURE OF WORK.—Hot and comparatively heavy work, but intermittent in character.

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HAMMERMEN.

(Including Shinglers.)

DUTIES.—Where a hammer is used for making the bloom (shingling) instead of a squeezer, the hammermen grasp the ball with a pair of tongs and hold it under a steam hammer or a drop hammer, turning it over continually until it is shaped into a rough bloom. Also applies to the hammermen who work piles made of muck bar down for rolling.

NATURE OF WORK.—This is very heavy work done under conditions of extreme heat. During the hammering sparks and pieces of scale fly widely, and to protect the eyes and face from these the hammer men usually wear masks of iron wire.

BLOOM BOYS.

(Including Bloom Slingers; Bloom Swinger; Buggy Men.)

DUTIES.—Take the bloom from the squeezer to the rolls, using a pair of tongs suspended from an overhead trolley or an iron buggy.

NATURE OF WORK.—Hot and fairly heavy work, but intermittent in character. Always performed by men.

ROLLERS.

DUTIES.—In charge of the rolling crew rolling the wrought-iron blooms down into long, rough pieces known as "muck-bar." The rolls are therefore known as muck rolls. The rollers usually handle the iron at the rolls, doing exactly the same work described for the "roughers-down" in bar mills. In some cases the work is largely supervisory, the actual work being done by roughers.

NATURE OF WORK.—A responsible position, requiring experience and skill. If, as is usual, the roller handles the bloom at the rolls, the conditions are the same as described for the rougher in bar mills.

ROUGHERS AND CATCHERS.

DUTIES.—Perform practically the same work, the catcher working on the opposite side of the rolls from the roller, and the rougher usually on the same side as the roller, or taking the place of the roller.

NATURE OF WORK.—See roughers and catchers, bar mills, p. 264.

ROLL HANDS.

DUTIES.—Include few cases where the various muck-bar occupations were not reported separately, the entire crew except the roller being combined under this name.

NATURE OF WORK.—Same as for catchers or hook ups.

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HOOK UPS, HOTBED MEN, AND SHEARMEN.

See same occupation in bar mills.

ROLL SCALE MEN.

DUTIES.—Clean up and preserve the scale from the squeezer and the rolls, which is used by the puddlers.

NATURE OF WORK.—Comparatively light work and done by unskilled workmen.

SCRAP PILERS.

(Including Fagot Makers.)

DUTIES.—Make up a rough box of pieces of muck bar into which small pieces of wrought-iron scrap are put and the whole bound with wire. These scrap piles or fagots are heated to a welding heat and rolled into muck bar.

NATURE OF WORK.—Light work, requiring little skill or experience.

HEATERS (SCRAP PILES).

DUTIES.—Heat the fagots or scrap piles to a welding heat for rolling.

NATURE OF WORK.—Requires highly skilled workmen

HEATERS' HELPERS (SCRAP PILES).

DUTIES.—Assist the heaters by making the fires and help to charge and draw the fagots.

KNOBBLERS.

DUTIES.—Make wrought iron by treatment of steel scrap in a knobbling furnace.

NATURE OF WORK.—These furnaces are comparatively small, being not over 4½ feet high. A furnace consists of a shallow hearth which may be water cooled; an arched cast-iron top so formed as to contain water; brick sides and back.

Near the bottom of the hearth tuyeres, two in number, enter, one from each side. Into the hearth is charged charcoal and soft steel scrap to a weight of about 300 pounds. Charcoal is used instead of coal or coke, because it is freer from impurities which would affect the quality of the iron. As the scrap softens it is constantly pried up and turned with a bar to allow the charcoal to roll down under it. When the steel melts, the blast from the tuyeres acts upon the metal to oxidize and remove the carbon as in the Bessemer process. As the carbon burns out the melting point rises and the metal "comes to nature" as in puddling. The knobbler works the mass into a ball which is finally taken out with tongs and "shingled" under a hammer. Very often it is heated in a reheating furnace and hammered a second

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time before being rolled into bar. The material thus obtained is used in the manufacture of iron pipe and of iron sheets. It probably is more nearly pure iron than other ordinary product.

ENGINEERS, STATIONARY.

DUTIES.—Operate the engines driving the squeezer and the muck rolls.

NATURE OF WORK.—The work is that of ordinary stationary engineers.

LABORERS.

DUTIES.—Perform the various unskilled jobs around the mill.

UNCLASSIFIED.

Includes various employees other than laborers not definitely enough designated to be included in any of the above groups.

EARNINGS AND HOURS AND DAYS OF WORK, BY OCCUPATIONS.

EARNINGS PER HOUR.

Data relative to earnings per hour for each occupation and each plant are shown in detail in Table I, Volume II, and for each occupation and each district in Table II. Table I shows for each plant separately customary number of working days per week, customary number of working hours per day, normal number of employees, average earnings per hour, and number of employees earning each classified amount per hour. Table II shows for each occupation and each district the number of plants reporting data, the number of employees included, and the average earnings per hour. The table is so arranged that a comparison is easily made of the earnings of time workers and of tonnage workers in the different occupations within each of the districts and also of the earnings of each of the two classes of workers in the several districts.

The tables here presented summarize the information concerning earnings. The table which follows is a summary of Table II with the exception that time and tonnage workers are not shown separately but are combined. The table is so arranged that a comparison is easily made of the earnings of any occupation in all of the districts and also a comparison of the earnings of the various occupations within a district.

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AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY DISTRICTS—PUDDLING MILLS.

Occupations.	New England district.	Eastern district.	Pittsburgh district.	Great Lakes and Middle West district.	Southern district.	Pacific Coast district.	Total, all districts.
Bloom boys:							
Plants	1	2	8	3	1	.....	15
Employees	1	10	18	6	2	.....	37
Average earnings per hour, cents	17.7	15.6	19.1	21.7	16.6	.....	18.4
Bushelers:							
Plants	1	11	4	3	1	2	22
Employees	16	177	43	184	30	17	467
Average earnings per hour, cents	28.7	36.2	59.1	44.0	28.3	91.0	43.2
Bushelers' helpers:							
Plants	.....	7	.....	.....	.....	1	8
Employees	.....	46	.....	.....	.....	8	54
Average earnings per hour, cents	.....	27.7	.....	.....	.....	47.6	31.2
Catchers:							
Plants	1	21	7	2	1	.....	32
Employees	19	[1]85	28	7	2	.....	[1]141
Average earnings per hour, cents	24.5	32.0	30.8	25.7	27.6	.....	30.3
Cinder men:							
Plants	2	5	7	3	.....	.....	17
Employees	5	20	52	14	.....	.....	91
Average earnings per hour, cents	15.4	17.1	16.9	16.7	.....	.....	16.9
Engineers, stationary:							
Plants	1	15	3	2	.....	.....	21
Employees		55	6	4	.....	.....	66
Average earnings per hour, cents	20.0	19.7	21.1	27.1	.....	.....	20.5
Hammermen:							
Plants	.....	3	1	1	.....	.....	5
Employees	.....	6	6	5	.....	.....	17
Average earnings per hour, cents	.....	41.3	41.5	59.7	.....	.....	47.3
Heaters (scrap piles):							
Plants	1	5	3	1	.....	.....	10
Employees	3	12	9	4	.....	.....	28
Average earnings per hour, cents	52.1	52.2	53.1	45.5	.....	.....	51.5
Heaters' helpers (scrap piles):							
Plants	1	5	2	1	.....	.....	9
Employees	6	16	5	4	.....	.....	31
Average earnings per hour, cents	16.8	26.9	25.0	23.1	.....	.....	23.9
Hook ups:							
Plants	1	20	7	2	1	1	32
Employees	9	[1]80	22	5	2	1	[1]119
Average earnings per hour, cents	12.7	19.6	19.0	23.5	19.5	45.3	20.2
Hotbed men:							
Plants	2	19	6	2	1	1	31
Employees	17	88	22	6	2	3	138
Average earnings per hour, cents	16.2	22.7	20.8	22.4	25.0	29.1	21.6
Knobblers:							
Plants	.....	2	.....	1	.....	.....	3
Employees	.....	26	.....	20	.....	.....	46
Average earnings per hour, cents	.....	40.7	.....	59.3	.....	.....	50.3
Laborers:							
Plants	3	15	10	3	.....	.....	31
Employees	111	290	181	48	.....	.....	630
Average earnings per hour, cents	14.4	15.9	16.0	17.4	.....	.....	15.8
Puddlers:							
Plants	2	21	11	4	2	.....	40
Employees	180	992	1,226	81	48	.....	2,527
Average earnings per hour, cents	35.4	37.3	31.7	42.7	35.0	.....	34.5
Puddlers' helpers:							
Plants	2	20	.....	1	1	.....	24
Employees	160	891	.....	28	46	.....	1,125
Average earnings per hour, cents	14.9	20.1	.....	24.3	17.4	.....	19.2

[1] Including 2 boys over 16 years of age.

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AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY DISTRICTS—PUDDLING MILLS—Concluded.

Occupations.	New England district.	Eastern district.	Pittsburgh district.	Great Lakes and Middle West district.	Southern district.	Pacific Coast district.	Total, all districts.
Rollers:							
Plants	1	20	8	4	1	1	35
Employees	7	[1]72	15	7	2	1	[1]104
Average earnings per hour, cents	41.2	39.1	65.3	68.2	50.0	116.1	47.2
Roll hands:							
Plants	.....	6	.....	2	.....	.....	8
Employees	.....	[1]12	.....	14	.....	.....	[1]26
Average earnings per hour, cents	.....	27.8	.....	23.2	.....	.....	25.3
Roll scale men:							
Plants	.....	10	3	2	.....	.....	15
Employees	.....	44	6	6	.....	.....	56
Average earnings per hour, cents	.....	14.0	16.1	16.5	.....	.....	14.6
Roughers:							
Plants	1	2	7	2	1	1	14
Employees	12	6	31	4	2	1	56
Average earnings per hour, cents	30.3	34.2	31.2	33.6	27.6	52.4	31.7
Scrap pilers:							
Plants	2	2	1	.....	1	.....	6
Employees	3	9	1	.....	12	.....	25
Average earnings per hour, cents	38.7	26.6	23.9	.....	17.2	.....	23.7
Shearmen:							
Plants	.....	9	5	4	.....	1	19
Employees	.....	44	25	13	.....	2	84
Average earnings per hour, cents	.....	16.6	20.3	22.3	.....	33.3	19.3
Squeezer men:							
Plants	1	13	.....	1	.....	.....	15
Employees	23	36	.....	2	.....	.....	61
Average earnings per hour, cents	12.6	17.6	.....	17.0	.....	.....	15.6
Stockers:							
Plants	2	20	9	4	.....	.....	35
Employees	28	263	72	47	.....	.....	410
Average earnings per hour, cents	16.6	16.6	20.2	19.1	.....	.....	17.0
Unclassified:							
Plants	2	10	7	3	.....	.....	22
Employees	8	37	37	26	.....	.....	108
Average earnings per hour, cents	23.5	19.9	19.9	21.7	.....	.....	20.6

Of all the employees 79.45 per cent were in the Eastern district and in the Pittsburgh district combined. Five plants were included from the Great Lakes and Middle West district, 3 plants from the New England district, and 2 for the Southern district and the Pacific Coast district. The number of employees in each occupation is small for the purposes of comparison in all the districts except the Eastern and the Pittsburgh districts. In most occupations the earnings are higher in the Pittsburgh district than in the Eastern district. This is particularly true in the occupations of "busheler" where the average earnings are 59.1 cents and 36.2 cents, respectively, in the occupation, and "rollers" where the average earnings are 65.3 and 39.1 cents, respectively. In the occupation of "puddlers" the numbers reported for each district are sufficiently large to permit of a comparison of all the districts except the Pacific Coast district.

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The average hourly earnings in that occupation were 42.7 cents in the Great Lakes and Middle West district, 37.3 cents in the Eastern district, 35.4 cents in the New England district, 35 cents in the Southern district, and 31.7 cents in the Pittsburgh district.

The next table compares the earnings of time workers and tonnage workers. A large proportion of the workers are tonnage workers, and in most occupations the tonnage workers earn more than do the time workers. In a few occupations, however, a small number of time workers are employed and the average earnings are much higher than the average earnings of tonnage workers in the same occupation.

COMPARISON OF AVERAGE EARNINGS PER HOUR OF TIME WORKERS AND OF TONNAGE WORKERS, BY OCCUPATIONS—PUDDLING MILLS.

Occupations.	Time.			Tonnage.			Time and tonnage combined.		
	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.
Bloom boys	9	24	$0.176	6	13	$0.198	15	37	$0.184
Bushelers	1	8	.822	21	459	.423	22	467	.432
Bushelers' helpers	1	8	.476	7	46	.277	8	54	.312
Catchers	2	[1]6	.174	30	135	.309	32	[1]141	.303
Cinder men	16	80	.160	3	11	.235	17	91	.169
Engineers, stationary	21	66	.205				21	66	.205
Hammermen	1	2	.165	4	15	.519	5	17	.473
Heaters (scrap piles)				10	28	.515	10	28	.515
Heaters' helpers (scrap piles)	2	5	.257	8	26	.236	9	31	.239
Hook ups	7	[1]26	138	27	93	.220	32	[1]119	.202
Hotbed men	10	39	.228	26	99	.192	31	138	.216
Knobblers				3	46	.503	3	46	.503
Laborers	31	630	.158				31	630	.158
Puddlers				40	2,527	.345	40	2,527	.345
Puddlers' helpers	1	30	.210	23	1,095	.192	24	1,125	.192
Rollers	1	[2]2	.175	34	102	.478	35	[1]104	.472
Roll hands	1	[2]2	.135	7	24	.264	8	[1]26	.253
Roll scale men	15	56	.146				15	56	.146
Roughers	1	4	.234	13	52	.324	14	56	.317
Scrap pilers				6	25	.237	6	25	.237
Shearmen	17	74	.191	3	10	.214	19	84	.193
Squeezer men	8	39	.136	7	22	.194	15	61	.156
Stockers	30	338	.166	16	72	.191	35	410	.170
Unclassified	16	78	.196	8	30	.237	22	108	.206

[1] Including 2 boys over 16 years of age. [2] Positions filled by boys over 16 years of age.

The next table shows for each of the principal occupations the average earnings per hour and the per cent of employees earning each classified amount per hour. The occupations are in order following the processes of manufacture.

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PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS—PUDDLING MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Stockers	35	410	$0.175	2.93	10.00	29.76	30.73	6.83	9.76	6.10	3.66	0.24	.....	.....	.....
Puddlers	40	2,527	.345	.....	.....	.....	.....	.....	4.59	21.01	62.17	6.09	6.13	.....	.....
Puddlers' helpers	24	1,125	.192	.....	2.31	18.67	12.71	13.16	47.64	5.51	.....	.....	.....	.....	.....
Bushelers	22	467	.432	.....	.....	.....	.....	.....	.....	16.27	44.75	7.71	22.06	3.00	6.21
Bushelers' helpers	8	54	.312	.....	.....	.....	.....	.....	3.70	55.56	25.93	14.81	.....	.....	.....
Rolling crew:															
Rollers	35	[1] 104	.470	.....	.....	.....	1.92	.....	.....	6.73	44.23	21.15	9.62	.96	15.38
Roughers	14	56	.317	.....	.....	.....	.....	.....	17.86	32.14	30.36	17.86	.18	.....	.....
Catchers	32	[1] 141	.303	.....	1.42	.....	.....	9.22	14.18	35.46	27.66	7.09	2.84	2.13	.....
Hook ups	32	[1] 119	.202	3.36	10.08	13.45	18.49	11.76	28.57	5.88	7.56	.84	.....	.....	.....
Roll hands, other	8	[1] 26	.252	.....	7.69	.....	.....	61.54	15.38	11.54	3.85	.....	.....	.....	.....
Hotbed men	31	138	.216	2.90	2.90	15.22	10.14	13.04	31.88	12.32	11.59	.....	.....	.....	.....
Laborers	31	630	.158	2.22	19.21	48.57	27.46	2.54	.....	.....	.....	.....	.....	.....	.....
Other occupations	.....	650	.227	2.62	9.38	21.08	12.92	8.15	19.69	11.08	3.23	3.69	6.77	.31	1.08
Total, all occupations	47	[2] 6,447	.274	.79	4.17	12.60	8.75	4.50	14.67	13.94	30.40	4.14	4.91	.31	.81

[1] Including 2 boys over 16 years of age. [2] Including 8 boys over 16 years of age.

The rollers are the highest-paid employees, the average earnings per hour for 104 employees being 47 cents. The lowest earnings in that occupation were 16 and under 18 cents per hour, received by two boys over 16 years of age doing the work of rollers. The highest amount received by rollers was in the class $1 and under $1.25; only 16.34 per cent of the rollers received 60 cents and over per hour; 44.23 per cent earned 30 and under 40 cents per hour. The occupation of puddlers includes 2,527 employees and is one of the highest paid occupations. The average earnings per hour was 34.5 cents. Of the employees in this occupation, 62.17 per cent earned 30 and under 40 cents per hour. The highest earnings were 50 and under 60 cents per hour and the lowest 20 and under 25 cents per hour. Laborers averaged 15.8 cents per hour, and 48.57 per cent earned 14 and under 16 cents per hour. The lowest earnings were under 10 cents and the highest 18 and under 20 cents.

The next summary shows for each of the districts the number of plants reporting, the normal number of employees, the average earnings per hour, and the number of employees earning each classified amount per hour. Time workers and tonnage workers are shown separately and the two classes are also combined.

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NUMBER OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS, BY DISTRICTS—PUDDLING MILLS.

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Number of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
TIME WORKERS.															
New England	3	194	$0.147	.....	63	87	43	.....	1	.....	.....	.....	.....	.....	.....
Eastern	20	[1] 746	.162	[2] 26	[3] 137	394	[2] 91	16	68	8	6	.....	.....	.....	.....
Pittsburgh	11	395	.177	13	18	80	162	31	58	30	3	.....	.....	.....	.....
Great Lakes and Middle West	4	161	.193	.....	.....	6	74	39	27	12	3	.....	.....	.....	.....
Pacific Coast	2	21	.571	.....	.....	.....	.....	.....	.....	3	2	8	.....	.....	8
Total, all districts	40	[1] 1,517	.173	[2] 39	[3] 218	567	[2] 370	86	154	53	14	8	.....	.....	8
TONNAGE WORKERS.															
New England	3	415	.256	.....	16	147	2	11	1	57	170	8	3	.....	.....
Eastern	24	2,571	.297	12	33	92	130	173	578	442	852	84	149	19	7
Pittsburgh	11	1,410	.326	.....	2	4	4	16	150	314	731	136	30	1	22
Great Lakes and Middle West	5	374	.405	.....	.....	.....	.....	2	63	3	143	30	128	.....	5
Southern	2	148	.262	.....	.....	2	58	2	.....	30	50	.....	6	.....	.....
Pacific Coast	1	12	.922	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	10
Total, all districts	46	4,930	.309	12	51	245	194	204	792	846	1,946	259	317	20	44
TIME AND TONNAGE WORKERS.															
New England	3	609	.219	.....	79	234	45	11	2	57	170	8	3	.....	.....
Eastern	24	[3] 3,317	.264	[2] 38	[3] 170	486	[2] 221	189	646	450	858	84	149	19	7
Pittsburgh	11	1,805	.291	13	20	84	166	47	208	344	734	136	30	1	22
Great Lakes and Middle West	5	535	.322	.....	.....	6	74	41	90	15	146	30	128	.....	5
Southern	2	148	.262	.....	.....	2	58	2	.....	30	50	.....	6	.....	.....
Pacific Coast	2	33	.698	.....	.....	.....	.....	.....	.....	3	2	9	1	.....	18
Total, all districts	47	[1] 6,447	.274	[2] 51	[3] 269	812	[2] 564	290	946	899	1,960	267	317	20	52

[1] Including 8 boys over 16 years of age.
[2] Including 2 boys over 16 years of age.
[3] Including 4 boys over 16 years of age.

The average hourly earnings of the 6,447 employees in 47 plants were 27.4 cents. The lowest rate reported was under 10 cents per hour. This occurred in one district, the Eastern. Ten and under 12 cents per hour was reported in two districts, the Eastern and the Pittsburgh. The highest rate reported was in the class $1 and under $1.25 in one district, the Pittsburgh district. The Great Lakes and Middle West district reported a rate of in the class 90 cents and under $1. Only 10.17 per cent of all the employees, however, earned 40 cents and over per hour. Of the total number of employees 30.40 per cent earned 30 and under 40 cents per hour, 14.67 per cent earned 20 and under 25 cents per hour, and 13.94 per cent earned 25 and under 30 cents per hour. Of all the employees, 26.31 per cent earned less than 18 cents per hour.

The table which follows shows the per cent of employees earning each classified amount per hour. These percentages were computed

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from the third section of the table immediately preceding, time workers and tonnage workers being combined.

PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS, BY DISTRICTS—PUDDLING MILLS.

Districts.	Number of establishments.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
New England	3	609	$0.219	.....	12.97	38.42	7.39	1.81	0.33	9.36	27.91	1.31	0.49	.....	.....
Eastern	24	[1] 3,217	.264	[2] 1.15	[2] 5.13	14.65	[2] 6.66	5.70	19.48	13.57	25.87	2.53	4.49	.57	0.21
Pittsburgh	11	1,806	.291	.72	1.11	4.65	9.20	2.60	11.52	19.06	40.66	7.53	1.66	.06	1.22
Great Lakes and Middle West	5	535	.322	.....	.....	1.12	13.83	7.66	16.82	2.80	27.29	5.61	[3] 23.93	.....	.93
Southern	2	148	.262	.....	.....	1.35	39.19	1.35	.....	20.27	33.78	.....	4.05	.....	.....
Pacific Coast	2	33	.698	.....	.....	.....	.....	.....	.....	9.09	6.06	27.27	3.03	.....	54.55
Total, all districts	47	[1] 6,447	.274	[2] .79	[2] 4.17	12.60	[2] 8.75	4.50	14.67	13.94	30.40	4.14	4.92	.31	.81

[1] Including 8 boys over 16 years of age.
[2] Including 2 boys over 16 years of age.
[3] Including 4 boys over 16 years of age.

In the New England district the bulk of the employees fall into three earnings groups—12.97 per cent earn under 14 cents per hour, 38.42 per cent earn 14 and under 16 cents per hour, and 27.91 per cent earn 30 and under 40 cents per hour. In the Eastern district, the bulk of the employees fall into four groups—25.87 per cent earn 30 and under 40 cents per hour, 19.48 per cent earn 20 and under 25 cents per hour, 14.65 per cent earn 14 and under 16 cents per hour, and 13.57 per cent earn 25 and under 30 cents per hour. Employees in the Pittsburgh district fall mainly in three earnings groups—40.66 per cent earn 30 and under 40 cents per hour, 19.06 per cent earn 25 and under 30 cents, and 11.52 per cent earn 20 and under 25 cents per hour. The employees in the Great Lakes and Middle West districts fall mainly in four earnings groups—27.29 per cent earn 30 and under 40 cents per hour, 24.86 per cent earn 50 cents and over (23.93 per cent earn 50 and under 60 cents), 16.82 per cent earn 20 and under 25 cents per hour, and 13.83 per cent earn 16 and under 18 cents per hour. The employees in the Southern district fall mainly in three earnings groups—39.19 per cent earn 16 and under 18 cents per hour, 33.78 per cent earn 30 and under 40 cents per hour, and 20.27 per cent earn 25 and under 30 cents. The number of employees included in the Pacific Coast district is too small to be of any particular importance.

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A summary in the form of cumulative percentages which follows shows the proportion of employees within certain earning limits:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR—PUDDLING MILLS.

Earnings per hour.	Number of employees.	Per cent of total number of employees.	Earnings per hour.	Number of employees.	Per cent of total number of employees.
Under 14 cents	[1] 320	[1] 4.96	Under 25 cents	2,932	45.48
Under 16 cents	1,132	17.56	Under 30 cents	3,831	59.42
Under 18 cents	[2] 1,696	[2] 26.31	Under 40 cents	5,791	89.82
Under 20 cents	1,986	30.81	Under 50 cents	6,058	93.96

[1] Including 6 boys over 16 years of age. [2] Including 8 boys over 16 years of age.

The per cent of employees earning less than specified amounts per hour in each district and for all districts is shown in the table which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR BY DISTRICTS—PUDDLING MILLS.

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning per hour—							
			Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	609	$0.219	12.97	51.39	58.78	60.59	60.92	70.28	98.19	99.50
Eastern	[1] 3,317	.264	[2] 6.28	20.93	[1] 27.59	33.29	52.77	66.34	92.21	94.74
Pittsburgh	1,805	.291	1.83	6.48	15.68	18.28	29.80	48.86	89.52	97.05
Great Lakes and Middle West	535	.322	.....	1.12	14.95	22.61	39.43	42.23	69.52	75.13
Southern	148	.262	.....	1.35	40.54	41.89	41.89	62.16	95.94	95.94
Pacific Coast	33	.698	.....	.....	.....	.....	.....	9.09	15.15	42.42
Total, all districts	[1] 6,447	.274	[2] 4.96	17.56	[1] 26.31	30.81	45.48	59.42	89.82	93.96

[1] Including 8 boys over 16 years of age. [2] Including 6 boys over 16 years of age.

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working hours per week are presented in detail for each occupation and each plant in Table I, Volume II of this report. These data are summarized in the text tables which follow. The first of these tables shows for each occupation the number of plants reporting, the normal number of employees, the average customary working hours per week, and the number of employees whose customary working time was each classified number of hours per week.

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NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH CLASSIFIED NUMBER OF HOURS PER DAY AND AVERAGE HOURS WORKED PER WEEK—PUDDLING MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—							
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Bloom boys	15	37	56.3	5	17	1	6	8	.....	.....	.....	.....
Bushelers	22	467	47.7	258	191	16	.....	2	.....	.....	.....	.....
Bushelers' helpers	8	54	47.4	34	18	.....	.....	2	.....	.....	.....	.....
Catchers	32	141	55.1	18	74	.....	11	38	.....	.....	.....	.....
Cinder men	17	91	60.5	.....	33	1	20	30	7	.....	.....	.....
Engineers, stationary	21	66	66.6	.....	4	.....	23	17	10	8	4	.....
Hammermen	5	17	51.0	4	11	.....	2	.....	.....	.....	.....	.....
Heaters (scrap piles)	10	28	52.8	7	14	.....	7	.....	.....	.....	.....	.....
Heaters' helpers (scrap piles)	9	31	54.3	4	17	.....	10	.....	.....	.....	.....	.....
Hook ups	32	119	55.7	8	71	.....	11	29	.....	.....	.....	.....
Hotbed men	31	138	55.5	12	79	6	11	30	.....	.....	.....	.....
Knobblers	3	46	45.5	26	20	.....	.....	.....	.....	.....	.....	.....
Laborers	31	630	59.0	47	105	5	369	83	21	.....	.....	.....
Puddlers	40	2,527	54.4	557	1,181	15	51	723	.....	.....	.....	.....
Puddlers' helpers	24	1,125	56.1	73	726	16	50	260	.....	.....	.....	.....
Rollers	35	104	55.9	11	57	1	8	23	4	.....	.....	.....
Roll hands	8	26	53.7	1	23	.....	2	.....	.....	.....	.....	.....
Roll scale men	15	56	59.5	.....	18	2	28	4	4	.....	.....	.....
Roughers	14	56	57.5	8	15	.....	2	31	.....	.....	.....	.....
Scrap pilers	6	25	49.4	16	.....	5	4	.....	.....	.....	.....	.....
Shearmen	19	84	58.6	3	30	5	21	25	.....	.....	.....	.....
Squeezer men	15	61	57.5	.....	24	.....	4	33	.....	.....	.....	.....
Stockers	35	410	58.0	42	85	14	189	70	10	.....	.....	.....
Unclassified	22	108	56.5	9	55	21	14	7	2	.....	.....	.....
Total, all occupations	47	6,447	55.2	1,143	2,868	108	843	1,415	58	8	4	.....

The table which follows shows for each principal occupation the per cent of employees working each classified number of hours. A large proportion of the employees in the skilled occupations directly connected with production work over 48 and under 56 hours per week. The occupations are in order following the processes of manufacture.

PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK—PUDDLING MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Stockers	35	410	58.0	10.24	20.73	3.41	46.10	17.07	2.44	.....	.....	.....
Puddlers	40	2,527	54.4	22.04	46.74	.59	2.02	28.61	.....	.....	.....	.....
Puddlers' helpers	24	1,125	56.1	6.49	64.53	1.42	4.44	23.11	.....	.....	.....	.....
Bushelers	22	467	47.7	55.25	40.90	3.43	.....	.43	.....	.....	.....	.....
Bushelers' helpers	8	54	47.4	62.96	33.33	.....	.....	3.70	.....	.....	.....	.....
Rolling crew:												
Rollers	35	104	55.9	10.58	54.81	.96	7.69	22.12	3.85	.....	.....	.....
Roughers	14	56	57.5	14.29	26.78	.....	3.57	55.36	.....	.....	.....	.....
Catchers	32	141	55.1	12.77	52.48	.....	7.80	26.95	.....	.....	.....	.....
Hook ups	32	119	55.7	6.72	59.66	.....	9.24	24.37	.....	.....	.....	.....
Roll hands, other	8	26	53.7	3.85	88.46	.....	7.69	.....	.....	.....	.....	.....
Hotbed men	31	138	55.5	8.70	57.25	4.35	7.97	21.74	.....	.....	.....	.....
Laborers	31	630	59.0	7.46	16.67	.79	58.57	13.17	3.33	.....	.....	.....
Other occupations	.....	650	57.2	11.38	37.38	5.38	21.38	19.08	3.54	1.23	0.62	.....
Total, all occupations	47	6,447	55.2	17.73	44.49	1.68	13.08	21.95	.90	.12	.06	.....

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The average customary working time per week for 6,447 employees in the special iron and steel occupations in the 47 puddling mill plants was 55.2 hours. The customary working time was over 48 and under 56 hours per week for 44.49 per cent of all employees, and the customary working time was over 60 and under 72 hours per week for 21.95 per cent of all employees.

The next table is a summary showing the number of employees working each classified number of hours per week within each district. The time workers and tonnage workers are shown separately.

NUMBER OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK, BY DISTRICTS—PUDDLING MILLS.

Districts.	Number of plants.	Normal number of employees.	Average hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
TIME WORKERS.												
New England	3	194	60.1	.....	3	5	140	44	2	.....	.....	.....
Eastern	20	746	58.5	12	222	17	432	45	8	8	2	.....
Pittsburgh	11	395	58.6	75	72	31	53	136	28	.....	.....	.....
Great Lakes and Middle West	4	161	61.7	.....	46	.....	38	71	4	.....	2	.....
Southern	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pacific Coast	2	21	54.1	.....	21	.....	.....	.....	.....	.....	.....	.....
Total, all districts	40	1,517	59.0	87	364	53	663	296	42	8	4	.....
TONNAGE WORKERS.												
New England	3	415	63.0	.....	2	18	19	376	.....	.....	.....	.....
Eastern	24	2,571	53.9	237	1,867	36	140	283	8	.....	.....	.....
Pittsburgh	11	1,410	53.6	506	436	.....	5	457	6	.....	.....	.....
Great Lakes and Middle West	5	374	49.4	203	149	1	16	3	2	.....	.....	.....
Southern	2	148	47.9	110	38	.....	.....	.....	.....	.....	.....	.....
Pacific Coast	1	12	54.5	.....	12	.....	.....	.....	.....	.....	.....	.....
Total, all districts	46	4,930	54.1	1,056	2,504	55	180	1,119	16	.....	.....	.....
TIME AND TONNAGE WORKERS.												
New England	3	609	62.1	.....	5	23	159	420	2	.....	.....	.....
Eastern	24	3,317	54.9	249	2,089	53	572	328	16	8	2	.....
Pittsburgh	11	1,805	54.7	581	508	31	58	593	34	.....	.....	.....
Great Lakes and Middle West	5	535	53.1	203	195	1	54	74	6	.....	2	.....
Southern	2	148	47.9	110	38	.....	.....	.....	.....	.....	.....	.....
Pacific Coast	2	33	54.3	.....	33	.....	.....	.....	.....	.....	.....	.....
Total, all districts	47	6,447	55.2	1,143	2,868	108	843	1,415	58	8	4	.....

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The average customary time worked for all time-workers was 59 hours per week, for all tonnage workers who are more directly connected with production, 54.1 hours per week. The difference is most striking in the Great Lakes and Middle West district. The table which follows shows for time workers and tonnage workers combined the per cent of employees customarily working each classified number of hours. The totals for all the districts are placed in comparison.

PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK, BY DISTRICTS—PUDDLING MILLS.

Districts.	Number of plants.	Normal number of employees.	Average hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and over 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England....	3	609	62.1	.....	0.82	3.78	26.11	68.97	0.33	.....	.....	.....
Eastern.....	24	3,317	54.9	7.51	62.98	1.60	17.24	9.89	.48	.24	0.06	.....
Pittsburgh.....	11	1,805	54.7	32.19	28.14	1.72	3.21	32.85	1.88	.....	.....	.....
Great Lakes and Middle West...	5	535	53.1	37.94	36.45	.19	10.09	13.83	1.12	.....	.37	.....
Southern.....	2	148	47.9	74.32	25.68	.....	.....	.....	.....	.....	.....	.....
Pacific Coast.....	2	33	54.3	.....	100.00	.....	.....	.....	.....	.....	.....	.....
Total, all districts..	47	6,447	55.2	17.73	44.49	1.68	13.08	21.95	.90	.12	.06	.....

A further combination shows that the customary time was 60 hours or over for 36.11 per cent of the total employees in all districts, for 95.41 per cent of all employees in the New England district, for 37.94 per cent of all employees in the Pittsburgh district, for 27.91 per cent of all employees in the Eastern district, for 25.41 per cent of all employees in the Great Lakes and Middle West district, and for none of the employees in the Southern district and the Pacific Coast district.

DAYS WORKED PER WEEK.

Under each occupation the customary working days or turns per week are shown for each plant in Table I, Volume II of this report. These data are briefly summarized here. The table which follows shows for each occupation the number of plants reporting, the normal number of employees, and the number of employees whose customary working time was each specified number of days or turns per week.

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NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH SPECIFIED NUMBER OF DAYS PER WEEK—PUDDLING MILLS.

Occupations.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Bloom boys	15	37	4	29	4	.....	.....
Bushelers	22	467	54	303	110	.....	.....
Bushelers' helpers	8	54	17	26	11	.....	.....
Catchers	32	141	9	120	12	.....	.....
Cindermen	17	91	.....	71	20	.....	.....
Engineers, stationary	21	66	2	12	40	8	4
Hammermen	5	17	.....	13	4	.....	.....
Heaters (scrap piles)	10	28	3	21	4	.....	.....
Heaters' helpers (scrap piles)	9	31	6	21	4	.....	.....
Hook ups	32	119	8	99	12	.....	.....
Hot-bed men	31	138	8	106	24	.....	.....
Knobblers	3	46	.....	32	14	.....	.....
Laborers	31	630	19	154	457	.....	.....
Puddlers	40	2,527	70	2,127	330	.....	.....
Puddlers' helpers	24	1,125	58	908	159	.....	.....
Rollers	35	104	6	80	18	.....	.....
Roll hands	8	26	.....	24	2	.....	.....
Roll-scale men	15	56	8	26	22	.....	.....
Roughers	14	56	.....	53	3	.....	.....
Scrap pilers	6	25	.....	12	13	.....	.....
Shearmen	19	84	1	62	21	.....	.....
Squeezer men	15	61	2	59	.....	.....	.....
Stockers	35	410	40	154	214	.....	2
Unclassified	21	108	.....	79	28	.....	1
Total, all occupations	47	6,447	315	4,591	1,526	8	7

The customary working time per week was 5 and 6 days or turns, alternating, for 4,591 employees, or 71.21 per cent, of the 6,447 employees reported in the special iron and steel occupations in the puddling-mill plants. The customary time per week was 6 days or turns for 1,526 employees, or 23.67 per cent of the total, and 5 turns per week for 315 employees, or 4.89 per cent of the total.

The table which follows shows the per cent of employees in the principal occupations in the puddling mills customarily working each specified number of days. The occupations are in order following the processes of manufacture.

PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH SPECIFIED NUMBER OF DAYS PER WEEK—PUDDLING MILLS.

Occupation.	Number of plants.	Normal number of employees.	Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Stockers	35	410	9.76	37.56	52.20	.....	0.49
Puddlers	40	2,527	2.77	84.17	13.06	.....	.....
Puddlers' helpers	24	1,125	5.16	80.71	14.13	.....	.....
Bushelers	22	467	11.56	64.88	23.55	.....	.....
Bushelers' helpers	8	54	31.48	48.15	20.37	.....	.....
Rolling crew:							
Rollers	35	104	5.77	76.92	17.31	.....	.....
Roughers	14	56	.....	94.64	5.36	.....	.....
Catchers	32	141	6.38	85.11	8.51	.....	.....
Hook ups	32	119	6.72	83.19	10.08	.....	.....
Roll hands, other	8	26	.....	92.31	7.69	.....	.....
Hotbed men	31	138	5.80	76.81	17.39	.....	.....
Laborers	31	630	3.02	24.44	72.54	.....	.....
Other occupations	.....	650	4.00	67.23	26.77	1.23	.77
Total, all occupations	47	6,447	4.89	71.21	23.67	.12	.11

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A large proportion of the employees in the principal occupations closely connected with production work 5 and 6 days or turns per week alternately, while a large proportion of employees in such occupations as laborers and stockers work 6 turns per week. Of the laborers, 72.54 per cent work 6 days or turns and of the stockers, 52.20 per cent.

The table which follows shows for each of the districts the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF DAYS PER WEEK, BY DISTRICTS—PUDDLING MILLS.

Districts.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	3	609	11	391	207	.....	.....	1.81	64.20	33.99	.....	.....
Eastern	24	3,317	297	2,136	874	8	2	8.95	64.40	26.35	0.24	0.06
Pittsburgh	11	1,805	6	1,548	248	.....	3	.33	85.76	13.74	.....	.17
Great Lakes and Middle West	5	535	1	363	164	.....	2	.19	68.79	30.65	.....	.37
Southern	2	148	.....	148	.....	.....	.....	.....	100.00	.....	.....	.....
Pacific Coast	2	33	.....	.....	33	.....	.....	.....	.....	100.00	.....	.....
Total, all districts	47	6,447	315	4,591	1,526	8	7	4.89	71.21	23.67	.12	.11

CRUCIBLE FURNACES.

INTRODUCTION.

The data relative to earnings and hours of work are summarized briefly in the pages immediately following and analyzed in more detail on pages 135 to 143.

SUMMARY OF EARNINGS AND HOURS AND DAYS OF WORK.

EARNINGS.

Data relative to earnings in crucible furnaces were reported for 633 employees in special occupations in 11 plants. The data for a large number of plants had to be omitted because the work was done on a contract basis, which made it impossible to obtain any satisfactory statements as to wages or hours. The average earnings per hour for the 633 employees were 26.5 cents. The number of plants included is so small that the data are not shown separately by districts. Of the 633 employees included, 20.22 per cent earned 16 and under 18 cents per hour; 19.43 per cent earned 20 and under 25 cents per hour, and 16.59 per cent 30 and under 40 cents per hour.

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The summary in the form of cumulative percentages, which follows, shows that 35.23 per cent of all employees earned less than 18 cents per hour and that 61.77 per cent earned less than 25 cents per hour.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR—CRUCIBLE FURNACES.

Earnings per hour.	Number of employees.	Per cent of total number of employees.	Earnings per hour.	Number of employees.	Per cent of total number of employees.
Under 16 cents	95	15.01	Under 30 cents	446	70.46
Under 18 cents	223	35.23	Under 40 cents	551	87.05
Under 20 cents	268	42.34	Under 50 cents	595	94.00
Under 25 cents	391	61.77			

HOURS OF LABOR.

Customary working hours per full time were reported for 633 employees in special iron and steel occupations in 11 crucible plants. Of all employees, 60.34 per cent worked 60 and under 72 hours per week, and 21.17 per cent worked 72 hours and over per week.

The classified customary working hours per week for the principal districts and for the total of all districts are shown in the following summary:

PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY PRINCIPAL DISTRICTS—CRUCIBLE FURNACES.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—		
			Over 48 and under 60.	60 and under 72.	72 and over.
Eastern	195	63.3	17.44	82.57	.....
Pittsburgh	271	65.8	22.51	34.32	43.18
Total, all districts	633	64.3	18.48	60.34	21.17

Only the Eastern and the Pittsburgh districts are shown in detail, for the reason that the numbers reported from the other districts are too small to be shown separately. They are, however, included in the total.

The average hours in the Pittsburgh district were higher than in the Eastern district, the difference being 2 hours per week.

The customary working hours were 60 and under 72 for 82.57 per cent of the employees in the Eastern district, and for 34.32 per cent of the employees in the Pittsburgh district. In the latter district, 43.18 per cent of the employees customarily worked 72 hours and over.

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DAYS PER WEEK.

Six days or turns per week was the customary working time for 423 employees, or 66.82 per cent of the 633 employees in the special iron and steel occupations in the crucible furnaces; 5 and 6 days or turns alternately was the customary working time for 29.70 per cent of the employees, and 7 days or turns for 3.32 per cent of the total.

The following table shows for the total and for each district the per cent of employees whose customary working time was 7 days or turns per week:

PER CENT OF EMPLOYEES WHOSE CUSTOMARY WORKING TIME PER WEEK WAS 7 TURNS—CRUCIBLE FURNACES.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Per cent of employees whose customary working time per week was 7 turns.	Districts.	Normal number of employees.	Per cent of employees whose customary working time per week was 7 turns.
New England	141	10.64	Great Lakes and Middle West	26	7.69
Eastern	195	.....	Total, all districts	633	3.32
Pittsburgh	271	1.48			

GENERAL DESCRIPTION OF EQUIPMENT AND METHOD OF OPERATION.

The crucible process, introduced about 1740, is still widely used for producing steel of high grade, in which it is essential that the proportion of carbon and alloys shall be exact. It is very costly on account of its small production and the heavy fuel and labor cost, but until the introduction of the electric furnace it was by far the best way of obtaining a high-grade steel, the exact composition of which could be determined in advance. As ordinarily practiced, it is essentially a melting operation, there being little purification, except, perhaps, as regards oxides and gases.

The following brief description of the equipment and process is taken, with some slight modification, from the recent work of Hugh P. Tiemann.[1]

Graphite crucibles are used in this country and principally on the Continent; clay crucibles chiefly in England. The crucible furnace may be heated by gas, coal, or coke. If the former, it is regenerative in principle, and consists of a number of chambers or holes (melting holes)—about 6 to 15 holes to each furnace, each hole holding 6 crucibles—in which the combustion of the gas takes place. The bottoms of the holes are covered with coke dust to protect the brickwork in case a crucible is broken, and provided with a hole [in the bottom] to permit of cleaning. * * *

[1] Iron and Steel (a pocket encyclopedia) by Hugh P. Tiemann, B. S., A. M., 1910, p. 85.

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In this country the charge is ordinarily 100 pounds, and the graphite crucible weighs about 50 pounds when new. The material employed is usually wrought iron or soft-steel scrap, together with a certain proportion of charcoal and oxide of manganese; occasionally blister [high carbon] steel is used * * *. The larger pieces are put at the bottom by the pot packer, the charcoal and oxide of manganese [or other alloys, together with the flux] on these [in the center], and the smaller pieces at the top; the cover is put on and the crucible set in the furnace by a man called the setter-in. * * * Depending on the composition of the charge (low carbon heats take much longer than high carbon), the melting, which is the first stage of the process, takes about two to four hours, and when it is judged that this has taken place, the man in charge, or melter, looks over the heat, i. e. uncovers certain of the pots to determine with his eye the condition of the contents; if necessary, he stirs them with a small rod to detect unmelted pieces. When this period is completed, the charge is frequently allowed to remain a [still] further period until the steel becomes tranquil, i. e., does not evolve gas. * * * This tranquilizing period is known as killing, and the steel when perfectly quiet is said to be dead. Killing takes from about one-fourth to one and three-fourths hours—usually from one-half to one hour—and if unduly prolonged the metal when cast is hard and brittle (also called dead), probably on account of excessive absorption of silicon. [When the entire furnace charge is handled in a ladle, the tranquilizing is commonly accomplished by adding aluminum or some other deoxidizer in the ladle.] The total time required for a heat is about three to four hours, three heats being made each turn of 12 hours. When ready the crucibles are drawn from the melting hole by the puller-out, set on the floor and the covers removed. In some cases they may be set temporarily in an iron-lined hole (teeming hole) in the floor. The slag (scum or flux) floating on top of the steel is removed (swabbed up) by means of a light iron rod with a ball of slag on one end (mop) against which it chills. Drawing by some mechanical device, instead of by hand, has not proved satisfactory as the crucibles are liable to slip or else be crushed. The steel is now teemed (poured) into molds, and any slag remaining is kept back by holding a bar (flux stick) against it. Each mold receives the contents of one crucible, or, if of larger size, several cruciblefuls are used, care being taken in every case that the stream does not strike the sides, and also that it is not momentarily interrupted, the latter causing the metal to freeze over (cold shut). Several cruciblefuls may also be poured into a ladle and the molds filled from this. The ingot after cooling is topped (the top broken off) to determine the grade by the appearance of the fracture (chemical analysis is now largely employed for this), and also for the purpose of removing the piped portion. Graphite crucibles were formerly allowed to cool between heats, but now are usually charged hot, i. e., returned to the furnace immediately without cooling after being inspected for cracks.

DESCRIPTION OF OCCUPATIONS.

In the following description of occupations the main occupation name shown represents the term retained in the report and under which data as to wages and hours of labor are presented. The names

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shown in parenthesis represent the most important minor occupations included under the name used in this report, as well as other terms used in various plants to indicate the same class of work. In the first paragraph, "Duties," is given a description of the functions which employees in the occupation perform and the method by which the work is done. In the second paragraph, "Nature of work," two points are covered: First, an indication of the type of workman required for the position, and, second, the conditions under which the work is done. The occupations are presented in the order of the processes of manufacture.

MELTERS.

DUTIES.—Have general charge of the melting of the steel in the crucibles. After the steel begins to melt, about three hours after being charged, the melter lifts the covers of the crucibles and examines their contents, stirring the steel with a long bar when necessary. It is upon his decision that the pots are pulled from the furnace. He also looks after the reversing of the gas in the furnace and has general charge of the entire furnace crew. In some plants he dumps the contents of the crucibles into a ladle, from which the steel is poured.

NATURE OF WORK.—A responsible position, demanding much skill and considerable knowledge, which can be gained only by practical experience. The melter's attention is required only part of the time during each heat, and he is free to go where he chooses for the rest of the time. During the examination of the crucibles and in dumping the steel from them he is exposed to excessive heat. During the examination of the crucibles he wears a wooden mask with blue glass over the eyeholes to protect his face from the intense heat and his eyes from the glare of the furnace.

PULLERS OUT.

(Including Setters in; Pot Pullers.)

DUTIES.—Set the pots or crucibles in the furnace, and when directed by the melter remove them. The crucible in either case is grasped with long tongs, which fit around it from above and enable it to be raised in a vertical position. Pullers out in many plants assist in filling the crucibles.

NATURE OF WORK.—The work of setting the pots in the furnace and of removing them is extremely hot, probably the hottest in the entire industry. The men protect themselves, however, by wearing special clothing, which is thoroughly wetted before beginning work, and by wearing cloth or other masks to protect the face and eyes. The work of setting and removing the pots lasts only a few minutes, and the men spell each other during these few minutes, so that the total exposure is very short.

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MOLDERS.

(Including Mold Tossers.)

DUTIES.—Prepare and set the small ingot molds into which the steel is cast, and strip them when cast. The molds are frequently made in two sections, which are held together by rings wedged into place. The molds are smoked on the inside before being put into place. After the ingots are cast, the molders remove, or strip, the molds. In many plants the molders pull the small iron wagons, in which the crucibles are set by the pullers out, to the melter or teemer.

NATURE OF WORK.—Hot, fairly heavy work, but with a good deal of leisure connected with it. The position does not require workmen with a great deal of skill or experience.

TEEMERS.

DUTIES.—As the crucibles are removed by the puller out, they are seized with tongs by the teemers, and the contents of each is poured into a mold, care being taken that the steel does not strike the sides of the mold and that the stream does not stop until the crucible is emptied. To aid the teemer a hot "brick" or cover, with a funnel-like hole through it, is set on top of each mold by the "brick boy."

NATURE OF WORK.—Very hard work, done under conditions of extreme heat, the exertion and the exposure, however, lasting for only a short time The position requires a great deal of skill and considerable strength.

SHEARMEN.

DUTIES.—Cut up scrap and wrought iron into pieces small enough for charging into the crucibles.

NATURE OF WORK.—Only unskilled laborers required; comparatively light work.

LABORERS.

Perform various unskilled work around the plant.

UNCLASSIFIED.

(Including Mixers; Pot Shakers; Pot Boys; Pipe Makers; Compounders; Ladle Men, etc.)

DUTIES.—Includes a miscellaneous collection of employees, chiefly concerned in preparing, weighing, and delivering the materials which are to be charged into the crucibles.

NATURE OF WORK.—Chiefly low-grade work requiring little experience, although one or two of the occupations, such as compounder, are of some importance.

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EARNINGS AND HOURS AND DAYS OF WORK, BY OCCUPATIONS.

EARNINGS PER HOUR.

Data relative to earnings per hour for each occupation and each plant are shown in detail in Table I, Volume II, and for each occupation and each district in Table II. Table I shows for each plant separately customary number of working days per week, customary number of working hours per day, normal number of employees, average earnings per hour, and number of employees earning each classified amount per hour. Table II shows for each occupation and each district the number of plants reporting data, the number of employees included, and the average earnings per hour. The table is so arranged that a comparison is easily made of the earnings of time workers and of tonnage workers in the different occupations within each of the districts and also of the earnings of each of the two classes of workers in the several districts.

The tables here presented summarize the information concerning earnings. The table which follows is a summary of Table II, with the exception that time and tonnage workers are not shown separately, but are combined. The table is so arranged that a comparison is easily made of the earnings of any occupation in all of the districts, and also a comparison of the earnings of the various occupations within a district. The data are shown only for the principal districts, as the number of employees in the other districts, as has already been noted, is too small to admit of comparison.

AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY DISTRICTS—CRUCIBLE FURNACES.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Occupations.	New England district.	Eastern district.	Pittsburgh district.	Total, all districts.
Laborers:				
Plants	2	2	4	9
Employees	29	33	70	134
Average earnings per hour.....cents..	16.5	18.8	16.3	16.8
Melters:				
Plants	2	3	4	10
Employees	4	20	18	46
Average earnings per hour.....cents..	126.1	53.5	60.4	67.1
Molders:				
Plants	1	3	5	10
Employees	28	40	45	123
Average earnings per hour.....cents..	19.3	22.9	21.6	21.4
Pullers out:				
Plants	2	3	5	11
Employees	32	42	52	134
Average earnings per hour.....cents..	31.4	32.6	35.5	34.1
Shearmen:				
Plants	.....	1	4	5
Employees	.....	4	22	26
Average earnings per hour.....cents..	.....	15.0	13.0	13.4
Teamers:				
Plants	1	1	4	6
Employees	12	4	16	32
Average earnings per hour.....cents..	47.9	31.0	35.2	39.9
Unclassified:				
Plants	1	3	5	10
Employees	36	52	48	138
Average earnings per hour.....cents..	19.3	19.3	17.7	18.8

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The number of plants included is so small that comparisons by occupations are of but little significance, except in such occupations as, for instance, laborers, molders, and pourers out. The average earnings of laborers was 16.5 cents per hour in the New England district, 18.8 cents in the Eastern district, and 16.3 cents in the Pittsburgh district, and 16.8 cents in all districts. Molders averaged higher in the Eastern than in any other district, and pullers out averaged higher in the Pittsburgh district than in any other.

The next table compares the earnings of time workers and of tonnage workers. Of the employees included in this tabulation 72.04 per cent are time workers. In the occupations most closely associated with production the employees are about equally divided as to method of payment. In practically every occupation where comparisons of time and tonnage earnings are possible, the tonnage workers receive a higher average wage. This is particularly marked in the occupation of melters; the 14 melters employed on a time basis averaged 49.9 cents per hour, and the 32 employed on a tonnage basis 74.9 cents per hour.

COMPARISON OF AVERAGE EARNINGS PER HOUR OF TIME WORKERS AND OF TONNAGE WORKERS, BY OCCUPATIONS—CRUCIBLE FURNACES.

Occupations.	Time.			Tonnage.			Time and tonnage combined.		
	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.
Laborers	9	134	$0.168	.....	.....	.....	9	134	$0.168
Melters	4	14	.499	6	32	0.749	10	46	.671
Molders	5	61	.199	5	62	.228	10	123	.214
Pullers out	6	72	.316	5	62	.366	11	134	.341
Shearmen	4	25	.130	1	1	.250	5	26	.134
Teemers	4	24	.422	2	8	.342	6	32	.399
Unclassified	10	126	.176	2	12	.303	10	138	.188

The table which follows shows for 4 of the most important occupations the number of employees reported, normal number of employees, average earnings per hour, and per cent of employees earning each classified amount per hour. The occupations are in order following processes of manufacture.

PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS—CRUCIBLE FURNACES.

Occupations.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Melters	10	46	$0.671	.....	.....	.....	.....	.....	.....	.....	15.22	21.74	21.74	13.04	28.26
Pullers out	11	134	.341	.....	.....	.....	.....	.....	.....	28.36	53.73	17.91	.....	.....	.....
Molders	10	123	.214	.....	.....	.....	13.01	26.02	49.59	8.13	3.25	.....	.....	.....	.....
Laborers	9	134	.168	.....	4.48	20.90	58.96	.....	15.67	.....	.....	.....	.....	.....	.....
Other occupations	.....	196	.213	11.22	8.67	11.22	16.84	6.63	20.92	3.57	11.22	5.10	4.08	.51	.....
Total, all occupations	11	633	.265	3.48	3.63	7.90	20.22	7.11	19.43	8.69	16.59	6.95	2.84	1.11	2.05

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The melters are the highest paid employees, the average earnings per hour for 46 employees being 67.1 cents. The lowest earnings in that occupation was 30 and under 40 cents per hour and the highest $1.25 and over; 36.96 per cent earned less than 50 cents per hour, and 28.26 per cent earned 70 cents and over per hour. The lowest paid occupation is that of laborers, their average earnings being 16.8 cents per hour. Considerably more than one-half of the laborers earned 16 and under 18 cents per hour. The lowest earnings in that occupation was 12 and under 14 cents and the highest 20 and under 25 cents per hour.

The next summary shows for each of the principal districts the number of plants reporting, normal number of employees, average earnings per hour, and number of employees earning each classified amount per hour. Time workers and tonnage workers are shown separately, and the two classes are also combined.

NUMBER OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, AND AVERAGE HOURLY EARNINGS, BY PRINCIPAL DISTRICTS—CRUCIBLE FURNACES.

[Data are not shown separately for districts in which only one plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Number of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
TIME WORKERS.															
New England	2	137	$0.243	.....	16	.....	31	21	18	3	35	6	7	.....	.....
Eastern	3	79	.186	.....	.....	21	20	3	32	1	.....	1	.....	.....	1
Pittsburgh	5	236	.216	22	7	27	77	9	23	22	43	1	1	4	.....
Total, all districts	11	456	.218	22	23	50	128	33	75	26	78	8	8	4	1
PIECE WORKERS.															
New England	2	4	1.251	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	2
Eastern	3	116	.318	.....	.....	.....	.....	12	26	28	27	10	10	3	.....
Pittsburgh	1	35	.439	.....	.....	.....	.....	.....	12	1	.....	16	.....	.....	6
Total, all districts	7	177	.379	.....	.....	.....	.....	12	48	29	27	36	10	3	12
TIME AND TONNAGE WORKERS.															
New England	2	141	.267	.....	16	.....	31	21	18	3	35	8	7	.....	2
Eastern	3	195	.267	.....	.....	21	20	15	58	29	27	11	10	3	1
Pittsburgh	5	271	.248	22	7	27	77	9	35	23	43	17	1	4	6
Total, all districts	11	633	.265	22	23	50	128	45	123	55	105	44	18	7	13

The average earnings for the 456 time-work employees was 21.8 cents per hour, and the average earnings for the 177 piecework employees was 37.9 cents per hour. The greater earnings of piece over time workers is due in part to the fact that a greater proportion of tonnage workers than of time workers are skilled employees, and

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also in part to the fact that within practically every occupation in crucible furnaces where employees are hired on both the time and tonnage bases the earnings of tonnage workers are greater than those of time workers.

The average earnings were exactly the same in the New England and the Eastern districts and slightly lower in the Pittsburgh district. The average for all employees considered was 26.5 cents per hour.

The table which follows shows the per cent of employees earning each classified amount per hour. Time and tonnage workers are combined.

PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, AND AVERAGE HOURLY EARNINGS, BY PRINCIPAL DISTRICTS—CRUCIBLE FURNACES.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
New England	2	141	$0.267	.....	11.35	.....	21.99	14.89	12.77	2.13	24.82	5.67	4.96	.....	1.42
Eastern	3	195	.267	.....	.....	10.77	10.26	7.69	29.74	14.87	13.85	5.64	5.13	1.54	.51
Pittsburgh	5	271	.248	8.12	2.58	9.96	28.41	3.32	12.92	8.49	15.87	6.27	.37	1.48	2.21
Total, all districts	11	633	.265	3.48	3.63	7.90	20.22	7.11	19.43	8.69	16.59	6.95	2.84	1.11	2.05

In the New England district 24.82 per cent of the employees earned 30 and under 40 cents per hour, and 21.99 per cent, earned 16 and under 18 cents per hour; in the Eastern district 29.74 per cent of the employees earned 20 and under 25 cents per hour; in the Pittsburgh district, 28.41 per cent earned 16 and under 18 cents per hour.

A summary in the form of cumulative percentages which follows shows the proportion of employees within certain earning limits:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR—CRUCIBLE FURNACES.

Earnings per hour.	Number of employees.	Per cent of total employees.	Earnings per hour.	Number of employees.	Per cent of total employees.
Under 16 cents	95	15.01	Under 30 cents	446	70.46
Under 18 cents	223	35.23	Under 40 cents	551	87.05
Under 20 cents	268	42.34	Under 50 cents	595	94.00
Under 25 cents	391	61.77			

Of the total number of employees, per 15.01 cent earned less than 16 cents per hour, and 35.23 per cent earned less than 18 cents per hour. Only 6 per cent of all employees earned 50 cents and over per hour.

The lowest rate reported was under 12 cents per hour. This occurred in the Pittsburgh district; 12 and under 14 cents per hour

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was reported in both the New England and the Pittsburgh districts. The highest rate reported was $1.25 per hour. Of the total employees in all districts 20.22 per cent earned 16 and under 18 cents per hour, 19.43 per cent earned 20 and under 25 cents per hour, and 16.59 per cent earned 30 and under 40 cents per hour.

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working hours per week are presented in detail for each occupation and in each plant in Table I, Volume II of this report. These data are summarized in the text tables which follow. The first of these tables shows for each occupation the number of plants reporting, the normal number of employees, the average customary working hours per week, and the number of employees whose customary working time was each specified number of hours per week:

NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, AND AVERAGE HOURS WORKED PER WEEK—CRUCIBLE FURNACES.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Laborers	9	134	65.8	.....	21	.....	34	13	55	9	2	.....
Melters	10	46	65.1	.....	4	4	1	27	8	2	.....	.....
Molders	10	123	64.5	.....	14	10	.....	83	16	.....	.....	.....
Pullers out	11	134	64.3	.....	22	8	.....	84	16	4	.....	.....
Shearman	5	26	61.5	.....	1	.....	20	4	1	.....	.....	.....
Teemer	6	32	62.4	.....	10	.....	.....	22	.....	.....	.....	.....
Unclassified	10	138	63.4	.....	22	1	47	47	17	.....	4	.....
Total, all occupations	11	633	64.3	.....	94	23	102	280	113	15	6	.....

The table which follows shows for each principal occupation in the order of processes of manufacture the per cent of employees customarily working each classified number of hours:

PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, AND AVERAGE HOURS WORKED PER WEEK—CRUCIBLE FURNACES.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Melters	10	46	65.1	.....	8.70	8.70	2.17	58.70	17.39	4.35	.....	.....
Pullers out	11	134	64.3	.....	16.42	5.97	.....	62.69	11.94	2.99	.....	.....
Molders	10	123	64.5	.....	11.38	8.13	.....	67.48	13.01	.....	.....	.....
Laborers	9	134	65.8	.....	15.67	.....	25.37	9.70	41.04	6.72	1.49	.....
Other occupations	.....	196	63.0	.....	16.84	.51	34.18	37.25	9.18	.....	2.04	.....
Total, all occupations	11	633	64.3	.....	14.85	3.63	16.11	44.23	17.85	2.37	.95	.....

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The average customary working time per week for the 633 employees in the special iron and steel occupations in 11 crucible plants was 64.3 hours. The customary working time was over 60 and under 72 hours per week for 44.23 per cent of all employees and 72 hours per week for 17.85 per cent of all employees.

The table which follows shows the per cent of employees whose customary working time was 72 hours and over per week and also the per cent whose customary working time was 84 hours and over per week. Only 0.95 per cent of the employees worked 84 hours and over, but 21.17 per cent worked 72 hours and over.

PER CENT OF EMPLOYEES IN THE PRINCIPAL OCCUPATIONS CUSTOMARILY WORKING 72 HOURS AND OVER PER WEEK—CRUCIBLE FURNACES.

Occupations.	Normal number of employees.	Per cent of employees whose customary working hours per week were—		Occupations.	Normal number of employees.	Per cent of employees whose customary working hours per week were—	
		72 and over.	84 and over.			72 and over.	84 and over.
Melters	46	21.74	.....	Laborers	134	49.25	1.49
Pullers out	134	14.93	.....	Total, all occupations	633	21.17	.95
Molders	123	13.01	.....				

The next table is the summary showing the number of employees working each classified number of hours per week within each district. The time workers and tonnage workers are shown separately.

NUMBER OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, AND AVERAGE HOURS WORKED PER WEEK, BY PRINCIPAL DISTRICTS—CRUCIBLE FURNACES.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
TIME WORKERS.												
New England	2	137	64.3	.....	.....	.....	56	68	.....	13	.....	.....
Eastern	3	79	62.1	.....	28	.....	3	48	.....	.....	.....	.....
Pittsburgh	5	236	65.2	.....	59	1	43	16	113	.....	4	.....
Total, all districts	11	456	64.5	.....	87	1	102	134	113	13	6	.....
TONNAGE WORKERS.												
New England	2	4	69.5	.....	.....	.....	.....	2	.....	2	.....	.....
Eastern	3	116	64.1	.....	6	.....	.....	110	.....	.....	.....	.....
Pittsburgh	1	35	65.7	.....	1	.....	.....	34	.....	.....	.....	.....
Total, all districts	7	177	63.9	.....	7	22	.....	146	.....	2	.....	.....
TIME AND TONNAGE WORKERS.												
New England	2	141	64.4	.....	.....	.....	56	70	.....	15	.....	.....
Eastern	3	195	63.3	.....	34	.....	3	158	.....	.....	.....	.....
Pittsburgh	5	271	65.3	.....	60	1	43	50	113	.....	4	.....
Total, all districts	11	633	64.3	.....	94	23	102	280	113	15	6	.....

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The average customary working time for the 456 time workers was 64.5 hours per week and for the 177 tonnage workers 63.9 hours per week.

The table which follows shows for time workers and tonnage workers combined the per cent of employees customarily working each classified number of hours per week. The totals for the principal districts are placed in comparison.

PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, AND AVERAGE HOURS WORKED PER WEEK, BY PRINCIPAL DISTRICTS—CRUCIBLE FURNACES.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84 hours
New England	2	141	64.4	.....	.....	.....	39.72	49.65	.....	10.64	.....	.....
Eastern	3	195	63.3	.....	17.44	.....	1.54	81.03	.....	.....	.....	.....
Pittsburgh	5	271	65.3	.....	22.14	0.37	15.87	18.45	41.70	.....	1.48	.....
Total, all districts	61	633	64.3	.....	14.85	3.63	16.11	44.23	17.85	2.37	.95	.....

Sixty and under 72 hours per week was the customary working time for 60.34 per cent of the total employees for all districts; 89.37 per cent of the employees in the New England district; 82.57 per cent in the Eastern district, and 34.32 per cent in the Pittsburgh district. More than one-fifth of all employees, 21.17 per cent, worked 72 hours and over. In the Pittsburgh district 43.18 per cent of the employees customarily worked 72 hours and over and in the New England district 10.64 per cent.

DAYS WORKED PER WEEK.

Under each occupation the customary working days or turns per week are shown for each plant in Table I, Volume II of this report. These data are briefly summarized here. The table which follows shows for each occupation the number of plants reporting, the normal number of employees, and the number of employees whose customary working time was each specified number of days or turns per week.

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NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH SPECIFIED NUMBER OF DAYS PER WEEK—CRUCIBLE FURNACES.

Occupations.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week were—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Laborers	9	134	.....	.....	123	.....	11
Melters	10	46	1	18	25	.....	2
Molders	10	123	.....	52	71	.....	.....
Pullers out	11	134	.....	76	54	.....	4
Shearmen	5	26	.....	.....	26	.....	.....
Teemers	6	32	.....	22	10	.....	.....
Unclassified	10	138	.....	20	114	.....	4
Total, all occupations	11	633	1	188	423	.....	21

The customary working time per week was 6 days or turns for 423 employees, or 66.82 per cent of the total number; 5 and 6 days or turns, alternately, was the customary days or turns per week for 188 employees, or 29.70 per cent of all employees.

The table which follows shows for each of the principal occupations the proportion of employees customarily working each specified number of days or turns per week:

PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH SPECIFIED NUMBER OF DAYS PER WEEK—CRUCIBLE FURNACES.

Occupations.	Number of plants.	Normal number of employees.	Per cent of employees whose customary working time per week were—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Melters	10	46	2.17	39.13	54.35	.....	4.35
Pullers out	11	134	.....	56.72	40.30	.....	2.99
Molders	10	123	.....	42.28	57.72	.....	.....
Laborers	9	134	.....	.....	91.79	.....	8.21
Other occupations	.....	196	.....	21.43	76.53	.....	2.04
Total, all occupations	.....	633	.16	29.70	66.82	.....	3.32

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The table which follows shows for each of the principal districts the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS PER WEEK, BY PRINCIPAL DISTRICTS—CRUCIBLE FURNACES.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	2	141	.....	72	54	.....	15	.....	51.06	38.30	.....	10.64
Eastern	3	195	1	32	162	.....	.....	0.51	16.41	83.08	.....	.....
Pittsburgh	5	271	.....	60	207	.....	4	.....	22.14	76.38	.....	1.48
Total, all districts	11	633	1	188	423	.....	21	.16	29.70	66.82	.....	3.32

BLOOMING MILLS.

INTRODUCTION.

The data relative to earnings and hours of work are summarized briefly in the pages immediately following and analyzed in more detail on pages 163 to 177.

SUMMARY OF EARNINGS AND HOURS AND DAYS OF WORK.

EARNINGS.

Data relative to earnings in blooming mills were reported for 4,485 employees in special occupations in 51 plants. More than one-half of the employees, 52.55 per cent, were in the Pittsburgh district and 81.85 per cent were in that district and the Great Lakes and Middle West district combined.

Of the 4,485 employees reported in blooming mills, 27.13 per cent earned 16 and under 18 cents per hour, 14.36 per cent earned 30 and under 40 cents per hour, and 12.80 per cent earned 20 and under 25 cents per hour. The average earnings per hour for all employees were 25.5 cents. The average earnings were highest in the Pittsburgh district, where 2,357 employees were reported. The average earnings as given are for all occupations taken together, including both skilled and unskilled employees.

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The average earnings per hour and the distribution of these earnings in the separate districts, as well as for the total of all districts, are shown in the table which follows:

PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—BLOOMING MILLS.

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.							
			Under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 cents and over.
New England	93	$0.222	.....	11.83	10.75	18.28	29.03	20.43	7.53	2.15	.....
Eastern	482	.230	19.08	19.29	6.85	2.07	20.12	15.77	10.58	3.11	3.11
Pittsburgh	2,357	.276	3.69	2.97	27.45	7.68	11.20	9.12	20.70	8.10	9.08
Great Lakes and Middle West	1,314	.235	3.12	8.60	38.13	10.88	12.33	7.46	5.10	6.39	7.99
Southern	239	.211	20.08	23.85	10.88	4.18	10.04	8.79	12.97	4.60	4.60
Total, all districts	4,485	.255	5.98	7.67	27.13	8.05	12.80	9.57	14.36	6.76	7.69

The summary in the form of cumulative percentages for the principal districts and for all districts which follows shows that 40.78 per cent of all employees earned less than 18 cents per hour; 48.83 per cent earned less than 20 cents per hour; and 71.20 per cent earned less than 30 cents per hour.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY PRINCIPAL DISTRICTS—BLOOMING MILLS.

Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning per hour—							
			Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
Eastern	482	$0.230	19.08	38.37	45.22	47.29	67.41	83.18	93.76	96.87
Pittsburgh	2,357	.276	3.69	6.66	34.11	41.79	52.99	62.11	82.81	90.91
Great Lakes and Middle West	1,314	.235	3.12	11.72	49.85	60.73	73.06	80.52	85.62	92.01
Total, all districts	4,485	.255	5.98	13.65	40.78	48.83	61.63	71.20	85.56	92.32

The above comparison shows that the earnings were under 18 cents per hour for 49.85 per cent of the 1,314 employees in the Great Lakes and Middle West district, 45.22 per cent of the 482 employees in the Eastern district, and 34.11 per cent of the employees in the Pittsburgh district.

The earnings were under 25 cents per hour for 73.06 per cent of the employees in the Great Lakes and Middle West district, 67.41 per cent of the employees in the Eastern district, and 52.99 per cent of the employees in the Pittsburgh district.

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HOURS OF LABOR.

Customary working hours per full week were reported for 4,485 employees in special iron and steel occupations in 51 plants. One-half of all employees, 50.43 per cent, worked 72 hours per week, and 17.88 per cent worked more than 72 hours per week.

The average and the classified customary working hours per week for the principal districts and for the total of all districts are shown in the following summary:

PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY PRINCIPAL DISTRICTS—BLOOMING MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—				
			Under 60.	60 and under 72.	72.	Over 72 and under 84.	84 and over.
Eastern	482	69.6	10.58	44.40	20.33	20.33	4.36
Pittsburgh	2,357	68.0	16.16	18.33	50.95	7.21	7.34
Great Lakes and Middle West	1,314	72.1	7.53	6.39	64.76	.61	20.70
Total, all districts	4,485	69.6	12.20	19.49	50.43	6.33	11.55

Of the total employees, 81.85 per cent were in the Pittsburgh and Great Lakes and Middle West districts. The average hours per week in those two districts were 68.0 and 72.1, respectively; the classified hours in those districts also show marked variations.

Further combinations of classified hours show that under 72 hours per week was the customary working time for 34.49 per cent of the employees in the Pittsburgh district and 13.92 per cent of the employees in the Great Lakes and Middle West district. Seventy-two hours per week was the customary working time for 64.76 per cent of the employees in the Great Lakes and Middle West district and 50.95 per cent in the Pittsburgh district. Over 72 hours per week was the customary working time for 21.31 per cent of the employees in the Great Lakes and Middle West district and 14.55 per cent in the Pittsburgh district.

DAYS PER WEEK.

Six days or turns per week was the customary working time for 3,262 employees, or 72.73 per cent of the 4,485 employees in the special iron and steel occupations in the 51 plants. Seven days or turns per week was the customary working time for 642 employees, or 14.31 per cent of the total; six and seven turns, alternating, for 217 employees, or 4.84 per cent of the total; five and six turns, alternating, for 244 employees, or 5.44 per cent of the total, and five turns for 120 employees, or 2.68 per cent of the total.

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GENERAL DESCRIPTION OF EQUIPMENT AND METHOD OF OPERATION OF ROLLING MILLS.

The rolling mill is the most efficient method of mechanically working iron or steel and at the same time giving it a variety of shapes or sections, which have the widest use in present-day construction. It also provides practically all the raw material (except castings) for all the machine shops, as well as a semifinished material for nails, wire, bolts, chains, and a hundred other similar products. The only other methods of mechanically working and shaping metals—the forge and the press—are insignificant both in amount and range of products when compared with the tremendous output and great variety of product of the rolling mill.

This range of products makes very difficult the classification and description of the mills in which they are made. When it is considered that practically all the steel to be worked in rolling mills starts as an ingot casting of from 1 to 10 tons and may be worked down to a rod no more than three-sixteenths of an inch in diameter and that the section of the product may vary from a square or round bar to that of a finished girder rail for street cars, the great complexity encountered in a consideration of this department is at once apparent. Furthermore, the difficulty is greatly increased by the fact that a rolling mill is an expensive but very durable mechanism, and that there are a number of mills still in operation which were built 50 or 60 years ago and which are totally different in method of working, particularly from the workman's standpoint, from the modern mills which make a similar product. This situation is often to be found in a single plant, or even in a few cases under the same roof. In the following description, therefore, nothing more can be attempted than to describe the more general features of rolling mills, together with such information as will make the data which follow clear, leaving the more detailed, though equally important, differences from the standpoint of the workman to be covered in the description of occupations.

The equipment of a typical rolling mill consists essentially of (1) furnaces, in which the piece to be rolled is heated; (2) a set or sets of rolls, which for present purposes may be described as metal cylinders mounted horizontally, one above the other, in suitable stands so that they may be rotated to apply pressure on the material which passes through them. The homely analogy of the clothes wringer perhaps best serves to convey some conception of their form and method of operation; (3) a shear or saw for cutting the rolled material into lengths; and (4) a proper place, a "hotbed," on which the material may be laid until it has cooled. Every mill, however, does not necessarily have all these divisions, and indeed may eliminate any one or all of them except the rolls by taking the product directly from a preceding mill at a rolling heat and delivering it to another one without

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shearing. This fact must particularly be borne in mind in considering the numbers of employees shown in the tables for the different occupations, which without this knowledge of this fact may appear inconsistent.

The most elementary classification of rolling mills, and, for the present purpose, the most important, separates them into hand mills (hand-operated mills) and mechanical mills (mechanically operated mills), according to the method of handling the material at the rolls and in transferring it between the different parts of the mill. In the typical hand mills the piece is handled throughout with tongs, the hot piece being drawn from the furnace and dragged to the rolls, where it is lifted and passed back and forth through the rolls by the members of the rolling crew until it is properly shaped, when it is once more dragged away across the floor and left to cool. In the typical mechanical mill the only function of the men when everything is working properly is to operate levers controlling conveyers and various other devices by which the material is put through the furnace, carried to the rolls, and passed back and forth through them until shaped and then transferred automatically to the hotbeds, or even to the shipping departments.

The furnaces used in rolling mills are primarily of two general types: First, vertical furnaces or "soaking pits," and second, horizontal reheating furnaces. The soaking pit, which is a device to maintain and equalize the temperature of ingots brought red hot from the open-hearth or the bessemer department, consists of a square fire-brick chamber 6 feet or more in depth below the level of the rolling-mill floor, and provided with regenerative chambers similar to those described under open-hearth furnaces for preheating the gas and the air by which the pits are heated. There are usually a number of these pits for each blooming or slabbing mill, each having a separate fire-brick cover mounted in metal frames carried on rollers and moved back and forth at will by hydraulic or electric mechanism. The bottom is covered with coke dust or some other material to absorb the slag and prevent corrosion of the bottom by the hot steel. The ingots are placed by large cranes in the pits with the small end, containing the "pipe" or shrinkage cavity, uppermost.

The horizontal reheating furnaces, which are used for heating or reheating all the material rolled except ingots, consist essentially of a shallow hearth with cast-iron bottom plate lined with some refractory substance, lateral walls of fire brick, and an arched roof of the same construction, the whole being encased in a steel framework or a complete casing. The furnace is reverberatory in principle—that is, the material is heated not by direct contact with the fuel, but by the flame or hot gases arising from its combustion, which are admitted to the hearth by flues and are deflected downward onto the hearth by

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the shape of the roof. The majority of the furnaces in this country are heated by gas, but in a number of the older type solid fuel is still burned, the flame passing over a fire-brick bridge and onto the hearth. In the older furnaces the pieces of metal to be heated are usually charged and drawn through the same opening at one end of the furnace; but in the modern furnace the material is charged at one end and drawn at the other, the pieces of metal being pushed through on parallel lines of water-cooled pipe by a mechanical pusher or carried through by conveyers. The latter type is called the continuous furnace and is considerably longer than the old-style furnace and usually provided with a hearth sloping downward from the charging to the drawing end.

The rolls used in rolling wrought iron and steel are cylinders of cast iron or of steel set in a suitable framework (the housing), in which they revolve. A set of rolls mounted in its housing is known as a stand, and two or more stands connected together constitute a train. In practically all the mills considered in the present report, except those in the puddling department, there are at least two stands of rolls.

Each roll consists of (*a*) the middle portion, called the barrel or body, which comes in contact with the piece being rolled; (*b*) the ends, which rest in the bearings of the housings, called the necks or journals, which are always of smaller diameter than the body to permit the rolls to come close together; and (*c*) specially formed connections on the ends of the journals, known as the wobblers, by which the rolls of one stand are connected to those of another on the same line or to the shafts by which power is transmitted to them. These connections are made by the spindles (metal cylinders of the same diameter as the neck of the roll), having wobblers of the same shape as those of the roll, which fit into corresponding openings in the coupling boxes, which complete the coupling. The wobbler may roughly be described as being formed by cutting three or four short, very deep grooves in the end of the neck of the roll, although in reality they are formed in casting the roll.

As the power is transmitted from the engine by a single shaft and as there are always two or three rolls in each stand which must be made to revolve at the same rate and in opposite directions, it is necessary to use gears to obtain this result. These gears, which are known as pinions, are mounted in housings similar to those used for the rolls and resemble short rolls with gear teeth cast on the barrel and provided at the ends with wobblers, by which each is connected through spindles to the roll to which it is to transmit power. In a mill having two rolls, therefore, the lower pinion would be connected on one side directly to the power shaft and on the other with the lower roll, while its gears intermeshing with those of the pinion above

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would transmit the power to the upper roll, to which it is connected, and thence through the connections of the rolls of the first stand to those of the other stands in the same line.

If two metal rolls are mounted close enough together and are rotated in opposite directions so as to grip a piece of metal softened by heating, they will exert enough pressure on it as it passes between them to reduce its cross section. If there were a semicircular groove around the body of the roll at just the point where the piece was entered, the piece, if soft enough, would be modified in cross section to the circular hole thus formed between the rolls, and a round bar would thus be formed. These two points cover broadly the theory of rolling mills; for by making the rolls large enough and the housings strong enough and applying sufficient power we may rapidly reduce the cross section to any desired degree, even up to 50 per cent for a single pass through the rolls, giving the piece a quarter turn each time to prevent it from flattening out; or, by modifying the shape of the grooves and providing raised collars of various forms on the upper and lower rolls, we may within limits produce almost any section for which there is any use in modern construction. These grooves and collars are formed by turning the rolls on lathes after they have been roughly cast. The opening between corresponding grooves or a groove and a collar in a pair of rolls is known as a pass. It is important, however, to remember that pass is also the term used for each passage of the piece of metal once through the rolls and is used perhaps more frequently in this sense than in the one above.

Rolling mills are of two special types according to the number of rolls placed one on the other in each stand. If there are only two rolls, the mill is known as a two-high mill, and if three, a three-high mill. All modern two-high mills, except sheet mills and those arranged in tandem with one stand directly following the other, are reversing; that is, the direction of each of the rolls is reversed after each pass, thus carrying the piece of metal back under pressure between them. If they are nonreversing, it is necessary to pass the piece back over the top roll to the side on which it started, which causes this type to be known as a pull-over or pass-over mill. It is obvious that a mill of this type can work only about half as fast as one in which pressure is being exerted on the piece as it passes in both directions. Furthermore, this type can be used only for light work, on account of the work of passing the piece back each time. To obviate these difficulties and at the same time save the machinery from the heavy strains given by reversing each time, George Fritz, in 1857, introduced the three-high mill, in which the piece is worked in either direction between the center roll and the other two. For this purpose, if the center roll is revolved in a clockwise direction, the upper and lower

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must be rotated counterclockwise, the piece usually being introduced between the center and the lower roll and brought back between the center and the upper roll.

The bearings in which the roll necks revolve are supported in the housings by blocks, known as chucks, which are held down, if no frequent adjustment is necessary, by large screws passing through the housing at both ends.

In two-high mills the distance between the rolls must be readjusted very frequently. This is accomplished in various ways by the use of hydraulic or mechanical devices. In either case the motion is controlled by a wheel or levers. For the large mills the distance between the rolls is indicated on a dial or some other gauge which is always in view.

In three-high mills these screws are turned by hand levers or spanners, but where the rolls are often adjusted mechanical means are provided.

In the hand mills no means other than tongs for handling the steel at the rolls is provided except long levers with slightly curved ends (hooks), a chain suspension not far from the center forming a fulcrum, and thus assisting in raising the piece of steel, and in a few cases small rollers attached to the housings in front of the rolls on which the piece may rest in pushing it between the rolls. If this roller is driven, it assists materially in pushing a heavy piece between the rolls. With these crude methods surprisingly large masses of metal, well over half a ton, were handled; but the number of men required was very large. The economy of handling ingots of from 2 to 10 tons was so great that some more efficient means of handling these large pieces had to be discovered. This means was found in the roll table, which consists essentially of a heavy steel framework in which rollers on which the steel rests are mounted in suitable bearings. One of these tables is on each side of the rolls. All or part of the rollers of the table are connected by gearing with some source of power and are so arranged that they may be rotated in either direction and reversed very quickly. For three-high mills it is necessary that the table shall be so arranged that either one end or the entire table may be raised to the level of the pass between the center and upper rolls, and this is ordinarily accomplished by hydraulic devices, which raise the table with a 3-ton ingot upon it with the greatest apparent ease. Frequently the tables are mounted on wheels, so that they may be moved sidewise to transfer the piece from pass to pass or from one stand of rolls to another. Even after the installation of the roll tables much heavy handling of the metal was left, because it was necessary to give the piece a quarter turn after each pass, as well as to guide it on the table. A device known as the manipulator was introduced, by which even this handling

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was eliminated. The manipulator in its most common form consists of long steel fingers which are placed between the rollers of the table and connected with proper mechanism, by which they can be raised or lowered or moved from side to side. By bringing a pair of the fingers under the edge of an ingot and bringing them up quickly it may be given a quarter turn, or by bringing them up alongside the ingot it may be moved from one side of the table to the other.

In order to assist the workmen in mechanical mills and in hand mills to properly enter the piece in the pass between the rolls, guides are used. These guides consist of pieces of metal mounted on bars in front of the pass, and which are so shaped that they form a very wide outer opening, which narrows down until the inner opening is roughly of the size and shape of the pass to which it is applied, so that the piece enters automatically in just the right position. These guides are very important in rolling rails and other shaped sections and in rolling very small sections where the pass is too small to be located easily at the high speed at which these mills are usually run. The latter mills are therefore commonly known as guide mills. For both these types of mills there is a tendency for the piece of metal to stick to one of the rolls and wrap itself around it. This is known as collaring, and any piece which does this, or otherwise is bent or twisted so that it can not be used, is termed a cobble. To prevent this as far as possible, specially shaped plates (guards) are placed at the top and bottom of each pass. The setting of these guides and guards on the mills where they are used becomes a very important function.

The size of all mills, except those for plates, is rated according to the diameter of the rolls used or, better, by the distance between pinion centers, as different sizes of rolls can be used in the same stand. Thus a 16-inch bar mill is one in which rolls the barrel of which is 16 inches in diameter are most commonly used, and in which the distance between the centers of the center and lower pinions is 16 inches. In the case of plate mills the size is rated on the width of plate with straight edges which can be rolled. For example, a 72-inch plate mill is one capable of turning out finished plate 6 feet wide after shearing. To give a clear understanding of the size of the mills represented in the classes presented below the following rough statements may be of value.

Blooming mills have rolls usually 36 to 48 inches in diameter. Sheared-plate mills have rolls 24 to 36 inches in diameter and from 6 to 12 feet in length. Universal mills have rolls of about the same diameter, but seldom over 7 feet long, which gives them a rating for universal plate of 4 feet or less; other plate mills for rolling very narrow thin material may have rolls only 14 inches in diameter; standard rail mills usually have rolls from 24 to 36 inches in diameter;

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while the other two classes of mechanical mills have rolls ranging from some 14 to 30 inches in diameter. The hand mills seldom have rolls less than 8 inches (there are a few 7-inch mills) or more than 22 inches in diameter. The typical rod mill contains a train of 16-inch roughing rolls, one of 10-inch intermediate, and a train of 9-inch finishing rolls.

Where a mill contains more than a single stand of rolls the stand or set in which the piece is first worked is known as the roughing rolls and the last is known as the finishing rolls, the others being known as the intermediate rolls or sets. In the hand mill, however, the stands are known by more specific names, which in a full train of six such stands, are as follows:

First stand (three high)	Roughing rolls.
Second stand (three high)	Pony roughing rolls.
Third stand (three high)	First strand rolls.
Fourth stand (three high)	Second strand rolls.
Fifth stand (two or three high)	Planishing rolls.
Sixth stand (two or three high)	Finishing rolls.

After the metal is rolled it must be allowed to cool and the hotbeds or cooling beds are simply places specially provided for this. In the ordinary hand mill the hotbed is simply a continuation of the floor formed of metal plates which are pierced with holes to allow circulation of air. In the mechanical mills rolling heavy product they are much more elaborate structures and usually consist of a bed of rails placed about 5 feet apart across which the material rests as it comes from the mill. Special means of transferring it across the bed is provided and consists usually of an endless chain carrying fingers which may be raised to catch the material and carry it away across the bed, where there is another conveyor consisting of a series of rollers placed in line parallel to each other and connected with gearing so that they can be revolved.

The material may be cut in either a hot or cold state by shears or saws, depending upon the section and the use to which it is to be put. The saws used are always circular, and the shears for cutting finished material consist of an upper knife, with its cutting edge at a slight angle like a guillotine, and connected with gears which move it up and down in a massive frame against a lower fixed knife edge.

As has been indicated above, the material in all modern mills is transferred from place to place by mechanical methods. In addition to cranes, or small power-driven cars in which the ingot is carried to the rolls, these conveyors usually consist of long lines of parallel gear-driven rollers similar to those of the roll table, which may be rotated in either direction, or of endless chains with projections which catch on the material and carry it along. The latter is used chiefly on hotbeds or for conveying the rolls of finished wire rods.

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As the general process for the different types of mills is very much the same, and the essential differences are described in detail in the description of occupations given below, it is necessary here merely to indicate the general steps through which the material passes in order to give coherence to the more detailed matter which has already been given or which follows this section.

The material used consists of: (*a*) Ingots, a name for castings specially formed for rolling. The ingots most commonly used in blooming mills weigh from 2 to 3 tons and are 6 or 7 feet high, about a foot square at the top, and 5 or 6 inches wider at the bottom, the slope being given in order to facilitate the removal of the molds. (*b*) Blooms or billets, these names being more or less indefinite and interchangeable, although in general it may be said that billets have a cross-section area of less than 36 square inches while blooms are of larger size. Blooms and billets are both sheared from the product of the blooming mill. (*c*) Slabs, which may have any cross-sectional area, but whose thickness does not exceed one-half the width.

These are charged into furnace, the ingots into soaking pits, the other pieces into reheating furnaces, from which they are drawn and delivered to the rolls when they have reached the proper temperature. With the aid of the roll tables and manipulators, or with no mechanical aids at all, according to the size and type of mill, the piece is passed back and forth between the rolls until it is thoroughly worked and reduced to the desired section or area.

It then passes on to the hotbeds, being sheared or sawed into small pieces either before or after cooling. If the material rolled is a section such as a rail, which it is essential should be without any curves or bends, it is straightened in special machines, and after giving it a rough finish to remove any irregularities of surface or ends it is ready for shipment.

DESCRIPTION OF OCCUPATIONS.

In the following description of occupations the main occupation name shown represents the term retained in the report under which data as to wages and hours of labor are presented. The names shown in parenthesis represent the most important minor occupations included under the name used in this report as well as other terms used in various establishments to indicate the same class of work. In the first paragraph, "Duties," is given a description of the functions which employees in the occupation perform and the method by which the work is done. In the second paragraph, "Nature of work," two points are covered: First, an indication of the type of workman required for the position, and, second, the conditions under which the work is done. The occupations are presented in the order of the processes of manufacture.

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HEATERS.

(Including Pit Heaters.)

DUTIES.—Are responsible for and direct the charging and drawing of the ingots by the pit cranemen and the maintenance of a proper temperature in the special type of furnace used for heating ingots, known as "soaking pits," which have been described above. Either the heaters, or under their direction, the helpers, attend to the reversing of the gas in the regenerative chambers. Frequent inspections (or, to an increasing extent, pyrometric tests) are made of the temperature of the ingots in the separate pits, and on the basis of these tests or inspections the heaters must so regulate the temperature of the pits that there will always be ingots at the proper temperature for rolling. In many plants heaters keep a record for each ingot of the time of charging and drawing and of the chamber in which it was placed, although in some plants clerks are supplied to do this work. Also supervise and, to some extent, at times, assist in cleaning and repairing the pits and in the preparation of new bottoms.

NATURE OF WORK.—A highly skilled and very responsible position. As most of the decisions as to the temperature of the pits and ingots are made only on the heater's ability to judge by inspection, a knowledge which can be gained only by long practical experience, the difficulty of securing good men for the position will be appreciated. The heater's attention is fully occupied by the number of points to which he must give consideration. There is no particularly hard manual labor connected with the position, but he is frequently exposed to high temperatures, and the general temperature of this part of the mill is usually high in summer, besides being in many plants so filled with smoke and waste gases that it is difficult to see from one end to the other.

HEATERS' HELPERS.

DUTIES.—Reverse the gas in the regenerative chambers of the pits and, under the direction of the heater, regulate the temperature; change the steel bits in the tongs of the pit crane, and in a few plants operate the nonautomatic pit crane tongs, although in some plants this is done by men in a separate occupation (pit tongs men); assist in repairs; and in general assist the heater in all his duties. In many plants they perform additional functions which are ordinarily given to separate occupations, such as make and repair bottoms, tap and clean out cinder, open and close the pit covers, and in a very few cases operate from a distance the ingot car.

NATURE OF WORK.—Where the work consists only in reversing the gas and otherwise generally assisting the heater, the work is not heavy or severe, except for the changing of crane bits, which is usually very hot work. Where, however, the duties of the specialized occu-

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pations are also embraced, all the conditions of work peculiar to those occupations must be encountered, except in the case of ingot-car operators, from which it differs in that the heater's helper, operating the car from a distance, is not exposed to the heat of the ingot. The proportion of idle time depends entirely on the particular combination of duties performed, but it is in any case intermittent work, so that the employee has some relief from any conditions of heat to which he may be exposed.

BOTTOM MAKERS.

DUTIES.—Make, level, and repair the coke-dust bottoms of the "soaking pits." This work is done by throwing in coke dust from the top of the pits while there are no ingots in them and working the coke into an approximately level condition with long iron bars. This is usually done while the pits are heated. When the bottom becomes too deep or contains much molten metal and scale, the bottom makers dig the bottom out, using a long iron bar with a sharp flat head and a scraper for removing the cinder.

NATURE OF WORK.—The greater part of this work requires exposure to excessive heat, from which the men protect themselves by tying wet cloths, etc., over exposed parts and by wearing heavy shoes with soles of wood. It is periodic in character, and they thus obtain relief from time to time. The making of bottoms under these necessary conditions is very severe and by no means unskillful work. The wage is, however, proportioned much more to the difficulty and severity of the work than to the knowledge and skill required.

BOTTOM MAKERS' HELPERS.

DUTIES.—Wheel coke dust needed in making bottoms, bring necessary tools, and assist in doing the harder and more exposed work of bottom making. In many plants they also perform the functions of the cinder men as described below.

NATURE OF WORK.—The work resembles in every particular that done by the bottom makers, the only difference being that the bottom makers are more highly skilled and supervise the work.

CINDER MEN.

(Including Cellar Men; Slag Men; Cinder Wheelers.)

DUTIES.—Tap the fluid slag and molten metal from the bottoms of soaking pits and wheel it to the cinder dumps or to some point in the yard. Each chamber of the soaking pits is arranged so that it can be tapped separately by opening up the tap hole with an iron bar, very much as the cinder notch of a blast furnace is opened.

NATURE OF WORK.—The work is unskilled and not very heavy. In performing it, however, they work in the cellars below the soaking pits proper, which are hot under any circumstances, and in which

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during the summer the heat is excessive. The men are in and out of the cellars during the work, and thus obtain relief from the heat, as well as during the short rests which occur between jobs.

COVER OPERATORS.

(Including Cover Boys; Door Boys; Pit Boys.)

DUTIES.—Operate levers which, through electric, hydraulic, or mechanical means, open and close the heavy fire-brick covers over the soaking pits when the pit craneman is ready to charge or draw ingots or for the heater or his helpers or for the bottom makers. In some cases the heaters' helpers perform this function.

NATURE OF WORK.—The work is light and is frequently performed by boys. In many plants the controlling levers are so far from the pits that no excessive heat is felt, but in a number the boys are exposed to excessive heat when actually at work. They usually arrange among themselves, however, to have a good deal of spare time.

PIT CRANEMEN.

(Including Drawing Cranemen; Charging Cranemen; Soaking Pit Cranemen; Ingot Cranemen.)

DUTIES.—Operate the cranes used for charging the ingots into the soaking pits, and, when they are of proper temperature, for drawing them from the pits as directed by the heater and placing them either in the ingot car or on the roll table. In the modern crane the tongs for gripping the ingot are mounted on a rigid bar and are controlled by levers from the crane cab; but formerly, and in a few mills at the present time, the tongs, which are shaped somewhat like ice tongs, must be guided and opened and closed by a helper, known as the "pit tongs man," or by one of the heaters' helpers. In a few plants separate cranes are used for charging and drawing, and in one or two the pit cranes are used to strip the ingots, i. e., remove the molds.

NATURE OF WORK.—The position is one of excessive heat as well as of discomfort from the gas fumes, particularly during the summer, because of the necessary position which the craneman must occupy directly over the soaking pits. For this reason it is customary to provide spell hands for the position during the hot weather, and in some cases to shorten the working hours considerably. The position is particularly bad if the crane cab is fixed directly over the tongs so that the craneman is exposed not only to the general heat from the pits but the very much higher temperature that rises from the heated ingot and open pit. Much care has been taken in a number of plants to render the position more tolerable by an extensive use of asbestos and other nonconducting substances in the construction of the crane cab. In addition to its severity the occupation demands considerable skill to charge and draw ingots with the rapidity and accuracy required in the modern blooming mill.

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INGOT-CAR OPERATORS.

DUTIES.—Operate the car or buggy by which the ingot is carried from the soaking pits to the roll table. In some plants this occupation is eliminated by using an electric buggy controlled from a distance by one of the heating or rolling crew or by having the pit cranemen drop the ingot on the roll table or a roller conveyor. As the soaking pit end of the mill is frequently so full of smoke and fumes that it is impossible to see for any distance, the use of a distant control is unsatisfactory and dangerous unless the distance is very short. Having the crane drop the ingot on the rolls frequently results in breakage or delays in putting the ingot in the right position for rolling.

NATURE OF WORK.—The work is comparatively simple, as the car is operated by a single controller handle, with one lever for tilting the ingot forward, and is consequently done by boys in a majority of cases. In most of the cars the car operator is given adequate protection from flying scale when the ingot enters the rolls and to a large degree from the heat of the ingot. Nevertheless, the position is uncomfortably hot in summer, and when the mill is going there is little rest unless spell hands are employed, which is a common practice during the hot months.

ROLL ENGINEERS.

DUTIES.—Really fall into two distinct classes, although they could not be so classified for this report. (1) Engineers on reversing engines for two-high mills. In this case they must not only keep the engine in good running order and see to repairs (in which they are usually aided by assistants), but occupy a position in the roller's platform or "pulpit" alongside the rolls and with levers connected with the engine throttle reverse the direction of the engine after every passage of the ingot through the rolls. (2) Engineers on nonreversing engines for three-high mills. In this case they simply act as ordinary stationary engineers, maintaining the engine at proper speed and keeping it in good running order. They must be on hand at all times to stop and start the engine at the roller's signal.

NATURE OF WORK.—The engineer on reversing engines must be not only an engineer of high grade and capable of quick decision and action in emergencies, but also occupies a position which requires constant attention and which in summer is exposed to considerable heat. The engineer on nonreversing engines is usually a considerable distance from the heat of the rolls and has a great deal of time in which he is waiting for the roller's signals, but is otherwise unoccupied. The engineer on reversing engines frequently assists in roll changes, while the engineer on nonreversing engines does not.

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ROLLERS.

DUTIES.—Operate rolls and are in charge of rolling crew during actual rolling and while changing rolls and making repairs. The nature and the difficulties of the rollers' duties vary widely with the different types of mills. For example, on slabbing mills the rollers operate levers controlling the mechanism by which the distance between the upper and lower main rolls and between the two side rolls is regulated, the space between the rolls being indicated on dials. In reversing blooming mills they operate the levers by which the distance between the upper and lower rolls is regulated, and also usually operate the levers controlling the direction and speed of rotation of the live rollers of the table. On three-high mills, where the distance between the rolls is fixed, the rollers operate the apparatus tilting or lifting the table for raising the ingot from the lower to the upper pass, and also the levers controlling the live rollers of the table. There are, of course, minor differences from this practice required by local conditions, but in the main they represent the typical situations. In the case of roll changes the work is largely supervisory.

NATURE OF WORK.—The roller's position is one requiring considerable skill and long experience, but the work is not of such high grade in these mills, which turn out an unfinished product ("blooms," "billets," and "slabs") as in the plate, standard rail, structural, light rail, and other shape mills, which turn out a finished article. The roller, however, is not valued so much for his services in tending the rolls while everything is going right as for his knowledge of what to do when there is trouble. There is no hard manual labor connected with the position, but where an ingot is being handled every minute or two and there are at times two ingots on the table at once, unremitting attention is required. In the case of a mill delay, he may rest, as when there is no hot steel, or he may have to work his hardest in repairing some broken part. Furthermore, the roller's platform, or "pulpit," is usually very near the rolls, and he is consequently exposed to relatively high temperatures during the entire turn in summer. Much has been done to relieve this heat in a number of plants by the installation of glass shields, curtains, and fans.

MANIPULATORS.

(Including Ingot Tilter; Lever Man; Manipulator Men.)

DUTIES.—Operate levers controlling a device by which ingots can be turned over or by which the ingot or bloom can be transferred laterally from one pass of the rolls to another. There are many types but the most common, perhaps, is that in which two or more "fingers" can be raised or lowered to project through the table, and thus brought

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up alongside an ingot, in which case lateral movement will transfer it from one side of the table to the other, or it can be brought sharply up under one edge of the ingot, and thus turn it over a quarter revolution at a time. In a few mills of older types this function is performed by the table men.

NATURE OF WORK.—The work is much more skilled and requires longer experience than any description would indicate. The men become wonderfully expert in using the manipulators, and it is upon the quickness with which the operation of turning and transferring the ingot can be performed that the production of the mill largely depends. The manipulator is exposed to much the same conditions of work as the roller, being located in the same pulpit with him or one close by. The manipulator assists in all roll changes and repairs not performed by millwrights.

TABLE MEN.

DUTIES.—Work alongside, or in a few cases, on the tables of the blooming mill and with long iron hooks guide the ingot or bloom into the right pass, or with a heavy iron tool with a square fork at the end which fits over a bloom, turns the bloom over when it is too small to be handled by the manipulator or is out of reach. In a few cases using a similar tool with a fork large enough to fit an ingot, they perform the functions described above for the manipulator. In some cases they operate an approach table or some form of conveyor or transfer in addition to the duties described above. They also throw salt on the slabs. When a slab reaches the highly heated rolls, the salt in combination with the water which is constantly flowing on the rolls causes a series of explosions, which blow the "scale" off the surface of the slab.

NATURE OF WORK.—This is very heavy manual labor done under conditions of excessive heat. In the mills equipped with the best types of manipulators, the table man's services are required only from time to time, when the piece becomes unmanageable, and in this case the position is relieved of its worst conditions. Where it is nesessary for table men to do all or the greater part of the work of handling the ingot or bloom, the position, even when frequently relieved by spell hands, is one of the most severe in the industry, because of the arduousness of the work and the excessive heat. The position is also one of great hazard from ingots falling off the tables and more especially from "cobbles" (blooms badly twisted in rolling and therefore unmanageable). There is also danger of serious injury to the eyes as well as minor burns from the flying "scale," which is driven back with considerable force when the ingot enters the rolls, or when slabs are scaled.

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CONVEYOR MEN.

(Including Transfer Lever Men; Transfer Men; Conveyor Switchmen.)

DUTIES.—Operate the various conveyors used in transferring ingots from the soaking pit to the rolls, or blooms from the rolls to the "hotbeds" and shears, and from there to the shipping department or to other mills. These conveyors generally consist of a long table, with mechanically driven rollers ("live rolls") on which the ingot or bloom rests and by which it can be shifted forward or backward by rotating the rolls in one direction or the other. At the side of the tables are plate guards, which prevent the piece from falling off the table.

NATURE OF WORK.—Operate levers which control the mechanism by which the conveyor is actuated. The greater number are now motor driven. Comparatively little skill is required for most of the positions, but in all constant attention is required and, in a few cases, the work is done under conditions of extreme heat. The ordinary duties do not require any heavy manual labor, but when there is any trouble the conveyor men have to work very hard for a short time.

SHEARMEN.

(Including Shear Operators.)

DUTIES.—Operate large shears by which the end of the partially rolled ingot containing the "pipe" (a cavity formed in the molten metal by the gases contained in the metal) is removed; shear the ingot when rolled down to size into shorter pieces called "blooms" or "billets," according to their size and length, or into "slabs," for use in the smaller rolling mills; supervise the entire shearing crew; and are responsible for keeping the shears and shear tables in proper working order. In many plants assist in roll changes.

NATURE OF WORK.—The work ordinarily falls into two parts: First, operating the roller table by which the piece is carried under the shears; and, second, setting the gauge which fixes the length of the piece and operating the lever controlling the mechanism (hydraulic, electric, or steam) by which the shear knife is made to cut (or, better, "bite off") the bloom or ingot. The operation does not require a great amount of skill, but the position is one of some responsibility, and there are usually a number of men working under the shearman's direction.

SHEARMEN'S HELPERS.

DUTIES.—Made up of two different classes: (1) Those who operate levers by which the gauge or stop against which the end of the bloom strikes to regulate the length, or levers for operating the "kick-off," a contrivance for knocking the sheared ends ("crop ends" or "bloom butts") off the shear table, or levers controlling the tables which carry

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the bloom away from the shears. (2) Unskilled men who drag the hot bloom butts or crop ends away from the shears with tongs and do any of the other required unskilled work around the shears. In a few cases shearmen's helpers do the work of stampers. Both classes of men assist the shearmen in setting and removing knives and in making minor repairs.

NATURE OF WORK.—The various lever men are not highly skilled, but their work requires very constant attention, and they may be regarded generally as in training for positions as shearmen. The unskilled work is not very heavy, as the crop ends are comparatively small, but it is rather hot work, particularly in summer, when the iron plates over which they drag the red-hot bloom ends become excessively hot. To protect themselves, heavy shoes with wooden soles are usually worn.

STAMPERS.

(Including Stampers and Strikers.)

DUTIES.—Stamp heat numbers, weights, etc., on the sheared blooms, billets, or slabs. For this purpose they use a heavy hammer with the proper die sunk in its head, or a die which is struck with a sledge. The striking is frequently done by one of the shearmen's helpers.

NATURE OF WORK.—Unskilled work, requiring no heavy manual labor. Although the workman stamps the blooms while they are still red hot, he can usually protect himself from exposure to extreme heat, and the job is consequently not very severe.

LOADERS AND STOCKERS.

DUTIES.—When the blooms leave the shears and hotbeds they pass either directly to another mill or are loaded into cars for shipment or are piled in the yards until needed. In either case the class of employees combined under this head handle them, loading and straightening them in the cars or piling them in the yards.

NATURE OF WORK.—Heavy unskilled work. There are usually times for rest during all considerable mill delays, and the work is therefore relieved of much of its arduousness. The chief hazard involved in the occupation is from the fall of improperly piled blooms and from the overhead cranes largely used in handling the material.

CRANEMEN.

(Including Mill Cranemen; Stock Cranemen; Loading Cranemen; Shear Cranemen; Hotbed Cranemen; Yard Cranemen.)

DUTIES.—Operate the various cranes (except pit cranes) used in the mill for handling rolls, defective metal, etc., as well as those in the shipping department (except locomotive cranes). These cranes

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are almost without exception electric cranes of relatively small capacity, and many of those in the shipping department are equipped with magnets.

NATURE OF WORK.—The handling of these smaller cranes does not require a great deal of skill, or very long experience. Many of them are in fact operated by boys after a few days' training. None of these cranes, except those in the shipping department, work very steadily, being used only when needed. The cranemen are in their cabs, however, the greater part of the time. With properly equipped cranes the hazards of the occupation—falls, electric burns and shocks, and danger of being run over by the crane or caught in the gears—are practically eliminated; but where these safeguards are not taken, frequent accidents of the kind mentioned occur.

ENGINEERS, STATIONARY.

(Including Shear Engineers; Table Engineers.)

DUTIES.—Operate the various small stationary engines for the shears and mill tables.

NATURE OF WORK.—Low-grade stationary engineers, men usually trained in the mill to do the work, which is comparatively light.

GREASERS.

(Including Table Greasers; Table Oilers; Roll Greasers; Transfer Greasers; Mill Greasers; Neck Greasers; Crane Oilers and Wipers.)

DUTIES.—Grease the roll bearings and mill-table gears and bearings, and oil the cranes, where this is not done by the cranemen themselves. These are distinct from the engine "oilers and wipers," who are carried in "general occupations."

NATURE OF WORK.—Low grade, unskilled, light work. When the mills are properly protected the occupation carries with it little hazard.

ROLL SCALE MEN.

(Including Sewer Men; Mill Scale Men.)

DUTIES.—Shovel out the scale which accumulates under the tables and in the "scale pits" under the rolls. This is wheeled away and used in the blast furnace or the open hearth. Also clean up the mill.

NATURE OF WORK.—Light, unskilled work. Frequently done by elderly men or men partially disabled.

LABORERS.

(Including Pit Tongs-Men's Helpers; Clean-ups; Coal Passers; Conveyor-Men's Helpers; Hotbed Helpers.)

DUTIES.—Includes all the unskilled workmen not carried under one of the specific occupations shown above.

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NATURE OF WORK.—Diversified both as to the difficulty of the work and the conditions under which it is done. It is generally more or less intermittent in character.

UNCLASSIFIED.

(Including Hoist Men; Test Boys; Door Couplers; Pan Men; Chargers, etc.)

DUTIES.—Includes chiefly occupations required by local conditions as well as a few minor occupations not important enough to be shown separately; for example, cranemen's helpers and chasers, whose duties are described on page 94.

NATURE OF WORK.—The grade of work and the conditions under which it is done vary widely. All boys not specifically reported under some occupation shown above are included here. The high rates reported are those in occupations required by local conditions.

EARNINGS AND HOURS AND DAYS OF WORK, BY OCCUPATIONS.

EARNINGS PER HOUR.

The number of employees reported in the New England and Southern districts for blooming mills was so small in comparison with the total that the data for those districts will not be considered in the discussion of the tables which follow. Complete data giving the details for the separate plants in each district will be found in Table I, in Volume II.

The tables here presented summarize the information concerning earnings. The table which follows is a summary of Table II, with the exception that time and tonnage workers are not shown separately, but are combined:

AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY DISTRICTS—BLOOMING MILLS.

Occupations.	New England district.	Eastern district.	Pittsburgh district.	Great Lakes and Middle West district.	Southern district.	Total, all districts.
Bottom makers:						
Plants	.....	2	20	8	3	33
Employees	.....	8	111	34	9	162
Average earnings per hour.....cents	.....	28.2	39.5	29.6	24.1	36.1
Bottom makers' helpers:						
Plants	.....	.....	14	6	2	22
Employees	.....	.....	81	25	6	112
Average earnings per hour.....cents	.....	.....	28.3	22.6	16.6	26.4
Cinder men:						
Plants	1	3	13	10	2	29
Employees	4	7	58	37	5	111
Average earnings per hour.....cents	18.0	14.3	12.5	17.1	14.3	17.7
Conveyor men:						
Plants	1	1	12	5	.....	19
Employees	2	2	42	35	.....	81
Average earnings per hour.....cents	22.9	14.5	21.9	17.3	.....	19.5
Cover operators:						
Plants	.....	2	21	11	4	38
Employees	.....	3	84	45	12	144
Average earnings per hour.....cents	.....	13.7	12.7	12.7	9.5	12.5

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AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY DISTRICTS—BLOOMING MILLS—Concluded.

Occupations.	New England district.	Eastern district.	Pittsburgh district.	Great Lakes and Middle West district.	Southern district.	Total, all districts.
Cranemen, other than pit:						
Plants	2	5	18	11	3	39
Employees	6	21	99	62	10	198
Average earnings per hour....cents.	16.7	19.8	21.0	21.4	20.6	20.9
Engineers, stationary:						
Plants	1	1	14	6	.....	22
Employees	2	5	42	18	.....	67
Average earnings per hour....cents.	19.5	22.9	22.4	21.5	.....	22.1
Greasers:						
Plants	.....	1	17	8	1	27
Employees	.....	2	93	46	1	142
Average earnings per hour....cents.	.....	26.1	19.8	18.4	17.5	19.4
Heaters:						
Plants	3	6	25	12	5	51
Employees	7	16	115	52	12	202
Average earnings per hour....cents.	30.2	48.1	55.6	53.5	46.8	53.2
Heaters' helpers:						
Plants	2	6	14	8	4	34
Employees	4	30	79	21	20	163
Average earnings per hour....cents.	23.0	28.9	28.5	25.7	27.5	28.0
Ingot-car operators:						
Plants	.....	3	11	6	1	21
Employees	.....	6	34	19	2	61
Average earnings per hour....cents.	.....	18.7	18.2	16.0	22.0	17.6
Laborers:						
Plants	3	5	20	12	2	42
Employees	5	130	381	383	49	957
Average earnings per hour....cents.	16.7	13.7	16.8	16.5	13.6	16.2
Loaders and stockers:						
Plants	2	2	8	9	3	24
Employees	18	48	104	56	28	254
Average earnings per hour....cents.	20.7	23.2	22.5	17.1	14.7	20.3
Manipulators:						
Plants	3	6	23	11	4	47
Employees	5	16	84	45	6	156
Average earnings per hour....cents.	25.2	32.8	35.7	37.1	32.5	35.4
Pit cranemen:						
Plants	2	4	23	11	3	43
Employees	5	25	179	70	8	287
Average earnings per hour....cents.	21.7	25.4	33.7	30.6	28.7	31.8
Roll engineers:						
Plants	3	6	23	11	4	47
Employees	5	17	97	40	6	165
Average earnings per hour....cents.	26.7	30.2	35.3	34.3	33.5	34.2
Rollers:						
Plants	3	5	25	12	5	50
Employees	6	10	91	42	8	157
Average earnings per hour....cents.	33.6	55.8	62.1	58.9	51.7	59.3
Roll scale men:						
Plants	1	2	16	9	3	31
Employees	3	11	87	34	8	143
Average earnings per hour....cents.	16.5	16.3	17.3	16.4	15.1	16.9
Shearmen:						
Plants	3	6	24	12	5	50
Employees	5	17	97	57	8	184
Average earnings per hour....cents.	21.9	30.8	33.8	33.7	27.3	33.0
Shearmen's helpers:						
Plants	1	5	21	10	4	41
Employees	2	27	172	47	24	272
Average earnings per hour....cents.	18.9	23.3	24.2	20.6	19.9	23.1
Stampers:						
Plants	.....	2	9	7	.....	18
Employees	.....	8	48	15	.....	71
Average earnings per hour....cents.	.....	15.7	21.6	16.6	.....	19.9
Table men:						
Plants	3	5	21	8	5	42
Employees	5	15	92	36	15	163
Average earnings per hour....cents.	19.9	31.3	30.0	28.3	20.3	28.6
Unclassified:						
Plants	3	5	13	11	2	34
Employees	9	40	87	95	2	233
Average earnings per hour....cents.	17.7	17.4	24.6	20.5	19.3	21.6

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In the above table the employees are entered in 23 occupational classifications (including unclassified). In 14 of the 23 classifications the earnings were higher in the Pittsburgh district than in either the Eastern or the Great Lakes and Middle West district. In 7 of the occupational classifications the Eastern district reported higher earnings than either the Pittsburgh or the Great Lakes and Middle West district, and in 2 cases the Great Lakes and Middle West district reported the highest earnings of the 3 principal districts.

In the Pittsburgh district, which includes 52.55 per cent of the total employees, the following occupations were reported as earning 30 cents or more per hour: Bottom makers, heaters, manipulators, pit cranemen, roll engineers, rollers, shearmen, and table men. These occupations comprise all the workmen who were in charge of the various operations of the mill.

The following occupations were reported in the Pittsburgh district as earning less than 18 cents per hour: Cover operators, laborers, and roll scale men. The cover operators, it should be remarked, are almost without exception boys 16 years or less of age. The roll scale men are practically laborers with distinct or definite duties, a description of which is given on page 162.

In the Great Lakes and Middle West district, which includes 12 of the 51 plants reported, the following occupations were reported as earning 30 cents or more per hour: Heaters, manipulators, pit cranemen, roll engineers, rollers, and shearmen. In the Eastern district the same occupations were reported as earning 30 cents or more per hour with the exception of pit cranemen.

In the Great Lakes and Middle West district the following occupations were reported as earning less than 18 cents per hour: Cinder men, conveyor men, cover operators, ingot-car operators, laborers, loaders and stockers, roll scale men, and stampers. In the Eastern district the same occupations, with the exception of ingot-car operators and loaders and stockers, were reported as earning less than 18 cents per hour. It will be noted, however, that the wages of laborers, which is the largest single occupational group reporting, received a considerably lower rate in the Eastern district than in either of the other districts, the rate in the Eastern district being 13.7 cents per hour, in the Pittsburgh district 16.8 cents per hour, and in the Great Lakes and Middle West district 16.5 cents per hour.

The next table compares the earnings of time workers and tonnage workers in the same occupational classifications. In every case where tonnage and time workers were reported for the same occupation the reported earnings of the tonnage workers were considerably higher than those of the time workers. This is noticeable not only in the

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case of the occupations requiring skilled workmen, but in such cases of unskilled workmen as cover operators, ingot-car operators, loaders and stockers, and roll scale men. The difference in favor of the tonnage workers is particularly noticeable in the case of the members of the rolling crew, in which the average rate per hour of tonnage workers was higher than that of time workers, to the extent shown by the following percentages: Rollers, 29.19 per cent; roll engineers, 38.89 per cent; manipulators, 56.90 per cent; and table men 34.22 per cent. As the production of the mills is, to a large extent, entirely dependent upon the exertion of these men, it is natural that they should be given an increased interest in the amount of production of the mills by means of the tonnage payments.

COMPARISON OF AVERAGE EARNINGS PER HOUR OF TIME WORKERS AND OF TONNAGE WORKERS, BY OCCUPATIONS—BLOOMING MILLS.

Occupations.	Time.			Tonnage.			Time and tonnage combined.		
	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.
Bottom makers	8	26	$0.243	26	136	$0.387	33	162	$0.361
Bottom makers' helpers	11	33	.204	13	79	.293	22	112	.264
Cinder men	29	98	.170	2	13	.228	29	111	.177
Conveyor men	12	51	.171	9	30	.246	19	81	.196
Cover operators	37	136	.122	3	8	.169	38	144	.125
Cranemen, other than pit	36	150	.195	10	48	.261	39	198	.209
Engineers, stationary	19	57	.218	3	10	.242	22	67	.221
Greasers	26	128	.189	3	14	.238	27	142	.194
Heaters	11	29	.431	41	173	.552	51	202	.532
Heaters' helpers	15	51	.213	21	112	.316	34	163	.280
Ingot-car operators	18	44	.157	6	17	.228	21	61	.176
Laborers	42	957	.162				42	957	.162
Loaders and stockers	18	120	.168	10	134	.239	24	254	.203
Manipulators	10	21	.239	39	135	.375	47	156	.354
Pit cranemen	11	43	.269	32	244	.328	43	287	.318
Roll engineers	22	48	.270	32	117	.375	47	165	.342
Rollers	13	31	.483	38	126	.624	50	157	.593
Roll scale men	30	136	.168	2	7	.177	31	143	.169
Shearmen	15	35	.236	39	149	.354	50	184	.330
Shearmen's helpers	24	97	.177	27	175	.264	41	272	.231
Stampers	15	47	.175	4	24	.247	18	71	.199
Table men	13	31	.225	31	132	.302	42	163	.286
Unclassified	31	180	.192	9	53	.311	34	233	.216

In order to study the occupations in greater detail, the table which follows shows for each of the principal occupations the number of plants reporting, the normal number of employees, average earnings per hour, and per cent of employees earning each classified amount per hour. The occupations are arranged in order following the processes of manufacture.

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PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS—BLOOMING MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Heaters	51	202	30.532	.....	.....	.....	.....	.....	.....	1.49	8.42	20.30	39.60	23.27	6.93
Laborers	42	957	.162	.....	13.17	18.50	67.92	0.42	.....	.....	.....	.....	.....	.....	.....
Manipulators	47	156	.354	.....	.....	.....	1.28	3.21	7.05	19.23	39.10	16.03	12.18	1.92	.....
Pit cranemen	43	287	.318	.....	.....	.....	.....	.70	17.77	20.91	37.63	19.86	3.14	.....	.....
Roll engineers	47	165	.342	.....	.....	.....	.....	1.21	5.45	27.27	37.58	24.24	.61	3.64	.....
Rollers	50	157	.593	.....	.....	.....	.....	.....	.....	1.27	4.46	20.38	32.48	15.92	25.48
Shearmen	50	184	.330	.....	.....	.54	1.63	5.43	9.78	23.37	34.78	14.13	10.33	.....	.....
Table men	42	163	.286	.....	.....	2.45	4.29	5.52	27.61	15.34	34.97	3.07	6.75	.....	.....
Other occupations	.....	2,214	.218	4.70	1.72	7.32	25.07	14.86	19.87	9.98	12.10	3.48	.63	.14	.14
Total, all occupations	51	4,485	.255	2.32	3.66	7.67	27.13	8.05	12.80	9.57	14.36	6.76	4.55	1.87	1.27

The laborers, including 957 of the 4,485 employees, are the lowest paid included in the above table, and average 16.2 cents per hour; 67.92 per cent of the total, it will be noted, earned 16 and under 18 cents per hour, the standard rates for common laborers in the Pittsburgh and Great Lakes and Middle West districts falling between these limits. A considerable number, 13.17 per cent, earned 12 and under 14 cents per hour, the majority of these being reported from the Eastern and Southern districts. Rollers were the highest paid employees reported, their average earnings being 59.3 cents per hour; the lowest paid of this occupation reported earning 25 and under 30 cents per hour, while the highest paid earned $1 and under $1.25 per hour. The majority, however, earned between 40 and 60 cents per hour. The next highest paid occupation, that of heaters, averaged 53.2 cents per hour, having the same range as in the case of rollers and a very similar distribution of earnings, except that there was a considerably smaller number at the very high rates.

It should be remembered, however, in considering these more highly paid occupations, that, although in the case of heaters, 6.93 per cent earned 70 cents per hour and over and 25.48 per cent of the rollers earned 70 cents and over, only 1.27 per cent of the total employees for this department earned as much as 70 cents per hour.

The next summary shows, by districts, the number of plants reporting, the normal number of employees, the average earnings per hour, and the number of employees earning each classified amount per hour. Time workers and tonnage workers are shown separately and the two classes are also combined.

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NUMBER OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, AND AVERAGE HOURLY EARNINGS, BY DISTRICTS—BLOOMING MILLS.

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Number of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
TIME WORKERS.															
New England	3	40	$0.197	.....	.....	10	8	12	1	7	.....	2	.....	.....	.....
Eastern	6	204	.143	2	86	83	24	5	3	1	.....	.....	.....	.....	.....
Pittsburgh	25	1,152	.187	52	33	68	625	142	130	52	37	3	10	.....	.....
Great Lakes and Middle West	12	994	.190	34	7	113	495	119	130	52	14	18	8	4	.....
Southern	5	159	.171	12	36	54	20	10	9	9	3	5	1	.....	.....
Total, all districts	51	2,549	.185	100	162	328	1,172	288	273	121	54	28	19	4	.....
TONNAGE WORKERS.															
New England	2	53	.245	.....	.....	1	2	5	26	12	7	.....	.....	.....	.....
Eastern	6	278	.284	4	.....	10	9	5	94	75	51	15	11	2	2
Pittsburgh	23	1,205	.368	.....	2	2	22	39	134	163	451	188	114	60	30
Great Lakes and Middle West	9	320	.394	.....	.....	.....	6	24	32	46	53	66	50	18	25
Southern	4	80	.315	.....	.....	3	6	.....	15	12	28	6	10	.....	.....
Total, all districts	44	1,936	.356	4	2	16	45	73	301	308	590	275	185	80	57
TIME AND TONNAGE WORKERS.															
New England	3	93	.222	.....	.....	11	10	17	27	19	7	2	.....	.....	.....
Eastern	6	482	.230	6	86	93	33	10	97	76	51	15	11	2	2
Pittsburgh	25	2,357	.276	52	35	70	647	181	264	215	488	191	124	60	30
Great Lakes and Middle West	12	1,314	.235	34	7	113	501	143	162	98	67	84	58	22	25
Southern	5	239	.211	12	36	57	26	10	24	21	31	11	11	.....	.....
Total, all districts	51	4,485	.255	104	164	344	1,217	361	574	429	644	303	204	84	57

The average hourly earnings for the 4,485 employees reported was 25.5 cents per hour. The average earnings for the 2,549 employees paid on a time basis was 18.5 cents per hour, and for the 1,936 employees paid on a tonnage basis 35.6 cents per hour. This difference between time and tonnage workers, it will be noticed, is greater than in the case of the separate occupations which have been considered above. The difference in the average earnings for the separate occupations, although in every case in favor of the tonnage workers, varies widely. For the total, however, there is a difference reported in favor of the tonnage workers of 92.43 per cent. An examination of the more detailed tables reveals the fact that this difference is largely due to the fact that all the laborers, who constitute 21.34 per cent of the total number, are paid only on a time basis.

The lowest rate reported was under 10 cents per hour, and the highest was in the class $1.00 and under $1.25 per hour. Only 3.14 per cent of all employees, however, earned 60 cents and more per

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hour. Of the total number 48.83 per cent earned less than 20 cents per hour.

The table which follows shows the per cent of employees earning each classified amount per hour. These percentages are computed from the third section of the table immediately preceding, in which time workers and tonnage workers are combined.

PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, AND AVERAGE HOURLY EARNINGS, BY DISTRICTS—BLOOMING MILLS.

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
New England	3	93	$0.222	.....	.....	11.83	10.75	18.28	29.03	20.43	7.53	2.15	.....	.....	.....
Eastern	6	482	.230	1.24	17.84	19.29	6.85	2.07	20.12	15.77	10.58	3.11	2.28	0.41	0.41
Pittsburgh	25	2,357	.276	2.21	1.48	2.97	27.45	7.68	11.20	9.12	20.70	8.10	5.26	2.55	1.27
Great Lakes and Middle West	12	1,314	.235	2.59	.53	8.60	38.13	10.88	12.33	7.46	5.10	6.39	4.41	1.67	1.90
Southern	5	239	.211	5.02	15.06	23.85	10.88	4.18	10.04	8.79	12.97	4.60	4.60	.....	.....
Total, all districts	51	4,485	.255	2.32	3.66	7.67	27.13	8.05	12.80	9.57	14.36	6.76	4.55	1.87	1.27

From the above table it will be seen that more than one-fourth of the total employees, 27.13 per cent, earned 16 and under 18 cents per hour; 14.36 per cent earned 30 and under 40 cents per hour; and 12.80 per cent earned 20 and under 25 cents per hour. It will be noted in considering these figures that the large per cent in the 30 and under 40 cents column is somewhat exceptional. It is due in large part, it will be seen, from the fact that the Pittsburgh district, which includes more than 50 per cent of the total employees, reported 20.70 per cent at this rate.

The summary in the form of cumulative percentages which follows shows that 13.65 per cent earned less than 16 cents per hour, and that 48.83 per cent earned less than 20 cents per hour, while 71.20 per cent earned less than 30 cents per hour:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR—BLOOMING MILLS.

Earnings per hour.	Number of employees.	Per cent of total number of employees.	Earnings per hour.	Number of employees.	Per cent of total number of employees.
Under 14 cents	268	5.98	Under 25 cents	2,764	61.63
Under 16 cents	612	13.65	Under 30 cents	3,193	71.20
Under 18 cents	1,829	40.78	Under 40 cents	3,837	85.56
Under 20 cents	2,190	48.83	Under 50 cents	4,140	92.32

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The per cent of employees earning each classified amount per hour in each of the principal districts and for all districts is shown by means of cumulative percentages in the table which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY PRINCIPAL DISTRICTS—BLOOMING MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning per hour—							
			Under 14 cts.	Under 16 cts.	Under 18 cts.	Under 20 cts.	Under 25 cts.	Under 30 cts.	Under 40 cts.	Under 50 cts.
Eastern	482	$0.230	19.08	38.37	45.22	47.29	67.41	83.18	93.76	96.37
Pittsburgh	2,357	.276	3.69	6.66	34.11	41.79	52.99	62.11	82.81	90.91
Great Lakes and Middle West	1,314	.235	3.12	11.72	49.85	60.73	73.06	80.52	85.62	92.01
Total, all districts	4,485	.255	5.98	13.65	40.78	48.83	61.63	71.20	85.56	92.32

Only the three principal districts are reported in the above table, in view of the fact that the Southern and New England districts reported too small a number of employees to merit consideration in the discussion which follows. These districts, however, it will be noted, are included in the total.

There is marked difference in the distribution of the earnings in the three principal districts, the Eastern district reporting 19.08 per cent earning less than 14 cents per hour, while the Pittsburgh and Great Lakes and Middle West districts reported 3.69 per cent and 3.12 per cent, respectively. Similarly, the Eastern district reported 38.37 per cent earning less than 16 cents per hour; while the other two districts reported 6.66 per cent and 11.72 per cent, respectively. In the column showing the percentage earning less than 18 cents, the difference is much less marked, the Eastern and Great Lakes and Middle West districts being approximately equal at this point, while the Pittsburgh district shows a much smaller percentage earning less than 18 cents. The difference is chiefly due to the fact that a much larger percentage of unskilled workmen is utilized in the mills represented in the Great Lakes and Middle West district than in either of the other districts. The marked differences between the districts continue throughout the remaining columns in varying proportions, the most marked point of difference, perhaps, being the fact that the Pittsburgh district shows approximately 40 per cent earning 30 cents or more per hour, while the other districts reported approximately only 20 per cent earning this amount.

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Considering all employees, both time and tonnage, the average earnings were considerably higher in the Pittsburgh district than in either of the other principal districts, the Great Lakes and Middle West district, however, showing a slightly higher average earning per hour than the Eastern district.

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working hours per week are presented in detail for each occupation and each plant in Table I, Volume II of this report. These data are summarized in the text tables which follow. The first of these tables shows for each occupation the number of plants reporting, the normal number of employees, the average customary working hours per week, and the number of employees whose customary working time was each specified number of hours per week.

NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK—BLOOMING MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under. 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Bottom makers	33	162	68.8	27	.....	.....	.....	8	108	6	13	.....
Bottom makers' helpers	22	112	67.7	21	.....	.....	2	8	69	4	8	.....
Cinder men	29	111	69.3	6	2	.....	11	14	63	9	6	.....
Conveyor men	19	81	67.8	12	.....	.....	.....	10	55	4	.....	.....
Cover operators	38	144	72.4	3	.....	.....	3	8	108	8	14	.....
Cranemen	40	198	72.9	6	1	8	2	22	103	26	28	2
Engineers, stationary	22	67	73.0	3	3	.....	3	2	35	17	7	.....
Greasers	27	142	74.2	.....	.....	.....	3	4	106	2	21	6
Heaters	51	202	68.5	39	.....	2	6	12	103	14	26	.....
Heaters' helpers	34	103	67.7	15	.....	16	10	34	68	13	7	.....
Ingot-car operators	22	61	70.4	3	.....	.....	.....	6	49	2	1	.....
Laborers	42	957	72.0	3	.....	2	132	188	384	43	204	1
Loaders and stockers	24	254	70.5	18	.....	8	17	24	136	22	29	.....
Manipulators	47	156	64.6	42	.....	4	7	22	69	5	7	.....
Pit cranemen	43	287	66.4	75	.....	.....	3	27	146	6	30	.....
Roll engineers	47	165	69.6	24	3	2	6	16	68	29	15	2
Rollers	50	157	64.8	39	.....	2	10	23	77	.....	6	.....
Roll scale men	31	143	73.1	.....	.....	6	9	9	69	31	19	.....
Shearmen	50	184	65.2	45	.....	4	9	27	86	6	7	.....
Shearmen's helpers	41	272	67.8	36	.....	6	13	53	138	16	10	.....
Stampers	18	71	70.0	6	.....	.....	2	6	46	11	.....	.....
Table men	42	163	67.0	27	.....	2	9	28	87	2	8	.....
Unclassified	34	233	69.5	24	1	4	22	44	89	8	39	2
Total, all occupations	51	4,485	69.6	474	7	66	279	595	2,262	284	506	13

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The table which follows shows for the principal occupations the per cent of employees customarily working each classified number of hours per week:

PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK—BLOOMING MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Heaters	51	202	68.5	19.31	.....	0.99	2.97	5.94	50.99	6.93	12.87	.....
Laborers	42	957	72.0	.31	.....	.21	13.79	19.64	40.13	4.49	21.32	0.10
Manipulators	47	156	64.6	26.92	.....	2.56	4.49	14.10	44.23	3.21	4.49	.....
Pit cranemen	43	287	66.4	26.13	.....	.....	1.05	9.41	50.87	2.09	10.45	.....
Roll engineers	47	165	69.6	14.55	1.82	1.21	3.64	9.70	41.21	17.58	9.09	1.21
Rollers	50	157	64.8	24.84	.....	1.27	6.37	14.65	48.04	.....	3.82	.....
Shearmen	50	184	65.2	24.46	.....	2.17	4.89	14.67	46.74	3.26	3.80	.....
Table men	42	163	67.0	16.56	.....	1.23	5.52	17.18	53.37	1.23	4.91	.....
Other occupations	.....	2,214	70.2	8.13	.18	2.17	4.38	11.38	56.10	8.08	9.12	.45
Total, all occupations	51	4,485	69.6	10.57	.16	1.47	6.22	13.27	50.43	6.33	11.26	.29

The above table shows a larger proportion of laborers working 84 hours than of any other occupation. This, it may be remarked, is the only occupation in the small group shown here which is not directly and necessarily connected with production. It may be further noted in considering this table that for the more highly skilled workmen a considerable proportion is working an 8-hour day. About one-fourth of the total number of manipulators, pit cranemen, rollers, and shearmen are reported as working 48 hours or less per week, and between one-sixth and one-fifth of the heaters and table men are reported at the same hours. Approximately one-half of the employees in all of these principal occupations here reported, are reported, however, as working 72 hours per week, which may be regarded as the normal operating time for the majority of blooming mills.

In order to bring the most important points of the preceding table into a smaller compass, the following table has been prepared in which the per cent of employees customarily working 72 hours or over per week, and also the per cent of employees customarily working 84 hours and over per week, are shown. In this table, it should be noted, the percentages are in cumulative form; i. e., the employees working 84 hours and over are also included in the column showing the per cent of employees customarily working 72 hours and over.

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PER CENT OF EMPLOYEES IN THE PRINCIPAL OCCUPATIONS CUSTOMARILY WORKING 72 HOURS AND OVER PER WEEK—BLOOMING MILLS.

Occupations.	Normal number of employees.	Per cent of employees whose customary working time was—		Occupations.	Normal number of employees.	Per cent of employees whose customary working time was—	
		72 hours and over per week.	84 hours and over per week.			72 hours and over per week.	84 hours and over per week.
Heaters	202	70.79	12.87	Shearmen	184	53.80	3.80
Laborers	957	66.04	21.42	Table men	163	59.51	4.91
Manipulators	156	51.93	4.49	Other occupations	2,214	73.75	9.57
Pit cranemen	287	63.41	10.45				
Roll engineers	165	69.09	10.30	Total, all occupations	4,485	68.31	11.55
Rollers	157	52.86	3.82				

The next table is the summary showing the number of employees customarily working each classified number of hours per week. The time workers and tonnage workers are shown separately.

NUMBER OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK, BY DISTRICTS—BLOOMING MILLS.

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
TIME WORKERS.												
New England	3	40	62.3	.....	.....	14	8	18	.....	.....	.....	.....
Eastern	6	204	69.0	.....	1	2	4	134	26	20	16	1
Pittsburgh	25	1,152	71.8	15	3	.....	155	139	535	142	153	10
Great Lakes and Middle West	12	994	73.9	.....	.....	.....	51	25	691	8	217	2
Southern	5	159	75.5	.....	.....	2	.....	31	70	4	52	.....
Total, all districts	51	2,549	72.5	15	4	18	218	347	1,322	174	438	13
TONNAGE WORKERS.												
New England	2	53	63.7	.....	.....	.....	20	33	.....	.....	.....	.....
Eastern	6	278	70.0	.....	.....	48	1	75	72	78	4	.....
Pittsburgh	23	1,205	64.3	360	3	.....	32	106	666	28	10	.....
Great Lakes and Middle West	9	320	66.8	99	.....	.....	8	.....	160	.....	53	.....
Southern	4	80	70.6	.....	.....	.....	.....	34	42	4	.....	.....
Total, all districts	44	1,936	65.7	459	3	48	61	248	940	110	67	.....
TIME AND TONNAGE WORKERS.												
New England	3	93	63.1	.....	.....	14	28	51	.....	.....	.....	.....
Eastern	6	482	69.6	.....	1	50	5	209	98	98	20	1
Pittsburgh	25	2,357	68.0	375	6	.....	187	245	1,201	170	163	10
Great Lakes and Middle West	12	1,314	72.1	99	.....	.....	59	25	851	8	270	2
Southern	5	239	73.8	.....	.....	2	.....	65	112	8	52	.....
Total, all districts	51	4,485	69.6	474	7	66	279	595	2,262	284	505	13

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The table which follows shows for time workers and tonnage workers combined the per cent of employees customarily working each classified number of hours per week. The total for all districts, as well as for each of the districts separately, is shown for purposes of comparison. The average hours per week for the three principal districts were very nearly the same, the Eastern district being slightly higher than the Pittsburgh district and about an equal amount lower than the Great Lakes and Middle West district. The hours were, however, somewhat differently distributed, as will be seen by an examination of the column showing the classified hours per week. For example: The Pittsburgh district reports 15.91 per cent whose customary working time per week was 48 hours and under, while the Great Lakes and Middle West district reports 7.53 per cent as working 48 hours or less and the Eastern district reports none at all in this group. On the other hand, the Eastern district reports 54.98 per cent of its employees as working less than 72 hours per week, while the Pittsburgh and the Great Lakes and Middle West districts show 65.50 and 86.07 per cent, respectively, working 72 hours or more per week. Furthermore, in the Great Lakes and Middle West district 20.70 per cent of the employees were reported as working 84 hours and over per week, while the Eastern and Pittsburgh districts show 4.36 per cent and 7.34 per cent, respectively, working 84 hours or more per week.

PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK, BY DISTRICTS—BLOOMING MILLS.

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	3	93	63.1	.....	.....	15.05	30.11	54.84	.....	.....	.....	.....
Eastern	6	482	69.6	.....	0.21	10.37	1.04	43.36	20.33	20.33	4.15	0.21
Pittsburgh	25	2,357	68.0	15.91	.25	.....	7.93	10.39	50.95	7.21	6.92	.42
Great Lakes and Middle West	12	1,314	72.1	7.53	.....	.....	4.49	1.90	64.76	.61	20.55	.15
Southern	5	239	73.8	.....	.....	.84	.....	27.20	46.86	3.35	21.76	.....
Total, all districts.	51	4,485	69.6	10.57	.16	1.47	6.22	13.27	50.43	6.33	11.26	.29

Average customary working time per week for the total number of employees in the 51 blooming mills was 69.6 hours. Customary working time per week was 72 hours and over for 68.31 per cent of the 4,485 employees and 84 hours and over per week for 11.55 per cent of the total number of employees. Less than one-third of the employees in blooming mills, 31.69 per cent, worked less than 72

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hours per week. It may be noted that 84 hours per week means 12 hours per day for 7 days per week. The number reported as working 84 hours or more per week was 11.55 per cent of the total. It may be remarked that there is no technical reason for operating the blooming mill on Sunday other than to slightly reduce the fuel costs for reheating the ingots.

DAYS WORKED PER WEEK.

Under each occupation the customary working days or turns per week are shown for each plant in Table I, Volume II of this report. These data are briefly summarized here. The table which follows shows for each occupation the number of plants reporting, the normal number of employees included, and the number of employees whose customary working time was each specified number of days or turns per week:

NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK—BLOOMING MILLS.

Occupations.	Number of plants.	Normal number of employees.	Number of employees whose customar working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Bottom makers	33	162	.....	4	145	.....	13
Bottom makers' helpers	22	112	2	2	98	2	8
Cinder men	29	111	2	9	85	6	9
Conveyor men	19	81	.....	6	75	.....	.....
Cover operators	38	144	3	2	119	6	14
Cranemen	39	198	4	16	121	16	41
Engineers, stationary	22	67	.....	2	38	17	10
Greasers	27	142	2	.....	108	2	30
Heaters	51	202	4	4	159	8	27
Heaters' helpers	34	163	24	6	113	13	7
Ingot-car operator	21	61	.....	5	55	.....	1
Laborers	42	957	2	66	568	28	293
Loaders and stockers	24	254	.....	7	194	22	31
Manipulators	47	156	8	13	124	4	7
Pit cranemen	43	287	2	17	232	6	30
Roll engineers	47	165	5	8	104	31	17
Rollers	50	157	9	11	131	.....	6
Roll scale men	31	143	6	.....	85	24	28
Shearmen	50	184	10	12	149	6	7
Shearmen's helpers	41	272	19	14	219	10	10
Stampers	18	71	2	.....	62	7	.....
Tablemen	42	163	10	10	133	2	8
Unclassified	34	233	6	30	145	7	45
Total, all occupations	51	4,485	120	244	3,262	217	642

Six days or turns per week was the customary working time for 72.73 per cent of the 4,485 employees in the blooming mills; one-seventh, 14.31 per cent, of the entire number, however, were employed for 7 days or turns per week; the remainder, amounting to 12.96 per cent, were employed either 5 days or turns per week or a combination of either 5 or 6 days or turns per week alternately, or 6 and 7 days or turns alternately. The number reported as working 7 days or turns per week, though small in comparison with some

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of the other departments, is nevertheless important. It arises from the necessity for a number of men being present on Sunday to maintain the proper temperature in heating the furnaces, and, more largely, because several of the mills were operating 7 days or turns per week regularly. It should be remembered in this connection that there is no technical necessity for the operation of the blooming mills continuously 7 days a week, and that the small number of men required to maintain the proper heat in the furnaces amounts to less than 2 per cent of the total number of employees. It may be well also to recall the fact that the employees included in this section of the report are only those directly connected with production, and not the workmen who are necessary for repairs or for a thorough inspection of the mill on Sunday.

The table which follows shows for each of the principal occupations the per cent of employees customarily working each specified number of days per week:

PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH SPECIFIED NUMBER OF DAYS PER WEEK—BLOOMING MILLS.

Occupations.	Number of plants.	Normal number of employees.	Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Heaters	51	202	1.98	1.98	78.71	3.96	13.37
Laborers	42	957	.21	6.90	59.35	2.93	30.62
Manipulators	47	156	5.13	8.33	79.49	2.56	4.49
Pit cranemen	43	287	.70	5.92	80.84	2.09	10.45
Roll engineers	47	165	3.03	4.85	63.03	18.79	10.30
Rollers	50	157	5.73	7.01	83.44	.....	3.82
Shearmen	50	184	5.44	6.52	80.98	3.26	3.80
Table men	42	163	6.13	6.13	81.60	1.23	4.91
Other occupations	.....	2,214	3.16	4.65	75.07	5.96	11.16
Total, all occupations	51	4,485	2.68	5.44	72.73	4.84	14.31

The occupation in the above table reporting the largest proportion of employees working 7 days or turns per week was that of laborers for whom 30.62 per cent were so reported. This comparatively large proportion includes two groups: One whose Sunday duties consist in cleaning up the mills; the other, a number of laborers who are employed during the week in connection with operation, but who are retained on Sunday in order to assist in repairs and in roll changes. The heaters, of whom 13.37 per cent were reported as working 7 days per week, show the next highest proportion of any of the above occupations. Their presence on Sunday is due to the fact mentioned above, that the gas is kept burning in the heating furnaces over Sunday in order to have steel ready for rolling early Monday morning. The pit cranemen, of whom 10.45 per cent are reported as working 7 days per week, are required to charge the cold ingots into the heating

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furnaces so as to have steel ready on Monday morning. Roll engineers utilize the Sunday period while the mill is shut down, in many cases, to make any necessary inspections or repairs, but it will be noted that a number of the roll engineers are reported as working 6 and 7 turns per week alternately, since most of this repair work can be done on a single turn, and in this way the men are able to have a Sunday off each alternate week. The rollers, manipulators, table men, and shearmen are reported as working 7 days per week in proportions varying from 3.80 per cent for shearmen to 4.91 per cent for table men. These employees, as a rule, have no Sunday duties except as directly connected with production.

The table which follows shows for each of the principal districts the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF DAYS PER WEEK, BY DISTRICTS—BLOOMING MILLS.

Districts.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	3	93	.....	59	34	.....	.....	.....	63.44	36.56	.....	.....
Eastern	6	482	42	127	135	96	82	8.71	26.35	28.01	19.92	17.01
Pittsburgh	25	2,357	78	58	1,890	111	220	3.31	2.46	80.19	4.71	9.33
Great Lakes and Middle West	12	1,314	.....	.....	1,036	4	274	.....	.....	78.84	.30	20.85
Southern	5	239	.....	.....	167	6	66	.....	.....	69.87	2.51	27.62
Total, all districts	51	4,485	120	244	3,262	217	642	2.68	5.44	72.73	4.84	14.31

A comparison of the principal districts shown in the above table reveals a considerable difference between the customary days worked per week in the Pittsburgh district. In this district 80.19 per cent of the employees were working 6 days or turns per week, while only 14.04 per cent were working either 7 days or turns per week or a combination of 6 and 7 turns per week in rotation; 3.31 per cent were employed for 5 days or turns and 2.46 per cent for a combination of 5 and 6 turns per week. In the Great Lakes and Middle West district, on the other hand, none of the employees were working less than 6 days or turns per week, there being 78.84 per cent reported as working 6 turns per week, and 20.85 per cent reported as working 7 days or turns per week. The Eastern district shows an entirely different situation, the proportions of the employees working each of the different combinations of days reported showing much less variation.

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PLATE MILLS.

INTRODUCTION.

The data relative to earnings and hours of work are summarized briefly in the pages immediately following and analyzed in more detail on pages 189 to 202. The description of equipment and method of operation on pages 146 to 153 applies to plate mills.

SUMMARY OF EARNINGS AND HOURS OF LABOR.

EARNINGS.

Data relative to earnings in plate mills were reported for 5,193 employees in 34 plants. Of these employees 55.52 per cent were in the Pittsburgh district and 85.94 per cent were in that district and the Eastern district combined.

Of the 5,193 employees included in this report on plate mills, 18.06 per cent earned 16 and under 18 cents per hour; 17.27 per cent earned 20 and under 25 cents per hour, and 12.42 per cent earned 25 and under 30 cents per hour. The average earnings per hour were 25.5 cents. This average is for all occupations taken together, including both skilled and unskilled employees.

If earnings are compared by districts they are seen to be highest in the Pittsburgh district, while between the two other principal districts, the Eastern and the Great Lakes and Middle West, the differences are practically negligible.

The per cent of employees earning each classified amount per hour both for the principal districts and for the total of all districts is shown in the table which follows. Only the three principal districts are shown in this table, as the number of employees in the other districts is too small for purposes of comparison.

PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY PRINCIPAL DISTRICTS—PLATE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average earnings per hour	Per cent of employees earning each classified amount per hour.								
			Under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 cents and over.
Eastern	1,580	$0.244	11.96	17.41	8.04	8.54	20.57	10.82	7.85	7.41	7.41
Pittsburgh	2,883	.266	5.69	4.93	23.20	9.64	15.75	13.91	14.92	4.47	7.49
Great Lakes and Middle West	624	.243	2.24	14.10	22.12	10.74	18.43	10.10	12.34	5.13	4.81
Total, all districts	5,193	0.255	7.95	10.21	18.06	9.36	17.27	12.42	12.34	5.35	7.03

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A summary in the form of cumulative percentages which follows shows that 18.16 per cent of all employees earned less than 16 cents per hour, 45.58 per cent earned less than 20 cents per hour, while 75.27 per cent earned less than 30 cents per hour.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY PRINCIPAL DISTRICTS—PLATE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning per hour—							
			Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
Eastern	1,580	$0.244	11.96	29.37	37.41	45.95	66.52	77.34	85.19	92.60
Pittsburgh	2,883	.266	5.69	10.62	33.82	43.46	59.21	73.12	88.04	92.51
Great Lakes and Middle West	624	.243	2.24	16.34	38.46	49.20	67.63	77.73	90.07	96.20
Total, all districts	5,193	.255	7.95	18.16	36.22	45.58	62.85	75.27	87.61	92.96

Only the principal districts are shown separately, as the number in the other districts is too small to merit separate discussion. The earnings were under 16 cents per hour for 29.37 per cent of the 1,580 employees in the Eastern district, 16.34 per cent of the 624 employees in the Great Lakes and Middle West district, and 10.62 per cent of the 2,883 employees in the Pittsburgh district. The earnings were under 20 cents per hour for 45.95 per cent of the employees in the Eastern district, 49.20 per cent of the employees in the Great Lakes and Middle West district, and 43.46 per cent of the employees in the Pittsburgh district.

HOURS OF LABOR.

The customary working hours per week in plate mills were reported for 5,193 employees in special iron and steel occupations in 34 plants. Over 60 and under 72 hours per week was the customary working time for 47.37 per cent of all employees and 72 hours was the customary working time for 24.67 per cent of all employees. A total of 30.93 per cent of all employees customarily worked 72 hours and over per week, or at least 12 hours a day for 6 days per week.

The average hours in the Great Lakes and Middle West district were 4.4 hours greater than in the Pittsburgh district, and the average hours in the Pittsburgh district were 5.8 hours greater than in the Eastern district. The per cent of employees working each classified number of hours per week for the principal districts and for the total of all districts is shown in the table following.

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PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY PRINCIPAL DISTRICTS—PLATE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—					
			48 and under.	Over 48 and under 60.	60.	Over 60 and under 72.	72.	Over 72.
Eastern	1,580	61.5	12.78	13.16	9.05	59.24	3.99	1.77
Pittsburgh	2,883	67.3	7.70	3.43	7.94	46.06	25.46	9.40
Great Lakes and Middle West	624	71.7	.....	.....	2.24	16.03	77.56	4.17
Total, all districts	5,193	66.0	8.16	5.95	7.59	47.37	24.67	6.26

The customary hours per week were less than 60 for 14.12 per cent of all employees. The proportion of employees customarily working less than 60 hours was 25.94 per cent in the Eastern district and 11.13 per cent in the Pittsburgh district. None of the employees in the Great Lakes and Middle West district worked less than 60 hours per week; 72 hours and over per week was the customary working time for 30.93 per cent of all employees in the combined districts, 81.73 per cent of all employees in the Great Lakes and Middle West district, 34.86 per cent of all employees in the Pittsburgh district, and 5.76 per cent of all employees in the Eastern district.

DAYS PER WEEK.

Tables on page 202 show that 6 days or turns per week was the customary working time for 70.25 per cent of the 5,193 employees in the special iron and steel occupations in the plate-mill plants. Five and 6 days or turns per week, alternating, was the customary working time for 22.84 per cent of all employees, 7 days or turns was the customary working time for 4.91 per cent of all employees; 6 and 7 days or turns, alternating, for 1.75 per cent of all employees; 0.25 per cent of all employees worked 5 days or turns per week. The per cent of employees whose customary working time per week was 7 turns is shown for three districts in the table which follows:

PER CENT OF EMPLOYEES CUSTOMARILY WORKING 7 DAYS PER WEEK, BY PRINCIPAL DISTRICTS—PLATE MILLS.

Districts.	Normal number of employees.	Per cent of employees whose customary working time per week was 7 days.
Eastern	1,580	0.89
Pittsburgh	2,883	7.67
Great Lakes and Middle West	624	3.21
Total, all districts	5,193	4.91

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DESCRIPTION OF OCCUPATIONS.

In the following description of occupations, the main occupation name represents the term retained in the report and under which data as to wages and hours of labor are presented. The names shown in parenthesis represent the most important minor occupations included under the name used in this report, as well as other terms used in various plants to indicate the same class of work. In the first paragraph, "Duties," is given a description of the functions which employees in the occupation perform and the method by which the work is done. In the second paragraph, "Nature of work," two points are covered, first, an indication of the type of workman required for the position, and, second, the conditions under which the work is done. The occupations are presented in the order of the processes of manufacture.

HEATERS.

DUTIES.—In charge of the furnaces for reheating slabs. Their duties are to maintain the proper temperature within the furnaces and to direct the charging and drawing of the slabs. As a rule the furnaces are not "continuous," the slabs being charged and drawn at the same end of the furnace. In some of the smaller modern mills continuous furnaces are in use.

NATURE OF WORK.—A highly skilled occupation, requiring long experience and considerable practical knowledge of the heat treatment of metals. Furnace temperatures are judged largely by the heater's eye, and a single error means the loss of a valuable steel slab. He is kept busy directing the charging and drawing of slabs, and regulating the valves controlling the gas and air. It is a much more highly skilled and responsible position than that of heater in the blooming mills.

HEATERS' HELPERS.

DUTIES.—Assist the heater in all his duties. The number employed and functions performed by them depend largely on the type of furnace and whether they perform any duties, such as charging slabs, usually performed by men in separate occupations. They repair bottoms in case cinder or sand bottomed furnaces are used, and also assist in making other repairs. Heaters' helpers frequently operate the conveyor which carries the slabs to the rolls.

NATURE OF WORK.—The work is very diversified, requiring in part highly skilled men and in part relatively unskilled men. Where a heater has a large number of furnaces under his direction, his first helpers are highly skilled men, capable of looking after all the details for the separate furnaces. The hardest work, which is done under

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conditions of high temperatures, comes when slabs become partly welded or stuck to the bottom or are wrongly placed in the furnace. This does not occur often, however.

CHARGING-CRANE AND CHARGING-MACHINE OPERATORS.

DUTIES.—Operate levers controlling the various types of charging cranes and machines used for placing slabs in the furnace and removing them when properly heated. The most common type consists of an overhead crane with a suspended revolving carriage on which is mounted a long arm with a special grip for holding the slab. The bar is hooked at the end so that it will fit over one end of a slab, the other end being held by a block controlled by the machine operator, which pushes the slab tightly into the hook. The whole arrangement is very much like hooking a bent fore finger over a slab, and then holding it in place with the thumb. In charging, the arm is swung over the trucks on which the slabs are brought from the slab mill, the arm is lowered and the hook at the end caught over the end of a slab, the bar carrying the holding block is then shoved up against the other end of the slab, which is then lifted and swung around in front of the proper furnace door. The furnace door is opened and the whole suspended carriage moves forward until the arm is well inside the furnace, the holding block is released, and the slab drops to the floor of the furnace. Other types of charging machines are much like those described for the open hearth. For the smaller plate mills using continuous furnaces, the charging machines may be simply arrangements for pushing the slabs from trucks to the bed of the furnace. The machine operator oils his machine and makes simple repairs and assists the millwright on larger repairs.

NATURE OF WORK.—The character of the work and the amount of skill and experience required vary widely according to the type of charging machine, as well as the kind of furnace used. In the majority of cases the work requires a good deal of skill, as there is a number of levers to be controlled and the work must be done rapidly. Under almost any condition the work is severe on account of the extreme heat, the general conditions being very similar to those of charging-machine operators in the open hearth. In a few cases the work is done by boys, but it is usually done by men who have some mechanical ability.

CHARGERS.

(Including Peel Men.)

DUTIES.—For the smaller plate mills and on one or two of the larger mills of the old type no charging machines are used, the slabs being charged by hand. For this, "peels," long iron bars flattened

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at the end, are used, the slabs being laid on the flat portion of the peel and shoved into the furnace.

NATURE OF WORK.—This is very heavy manual labor, usually done under conditions of extreme heat. In order to place a slab at the other end of the furnace from where it is charged, the men have to approach very close to the open door of the furnace.

DOOR OPERATORS.

(Including Door Boys; Pull Ups.)

DUTIES.—Raise and lower the doors of the furnace for charging and drawing and for the heater's inspection. The doors are usually counterweighted so that they can be operated by pulley.

NATURE OF WORK.—Light work, usually done by boys. The conditions are analogous to those of the door operator in the open hearth except that the operator is usually much nearer the furnace.

CINDER MEN.

(Including Cinder Tappers; Slag Men.)

DUTIES.—Tap out the cinder which forms at the bottom of the furnace. This cinder contains a high percentage of iron, and is consequently cast into convenient shapes to be used in the open hearth.

NATURE OF WORK.—Unskilled work. Very little heavy manual labor, and the exposure to heat does not last long.

ROLL ENGINEERS.

DUTIES.—See same occupation name on page 157. Very few of the plate mills in this country are reversing, the majority being "three high."

NATURE OF WORK.—Same general conditions as in blooming mills.

SHEARED-PLATE MILLS—ROLLING CREW.

ROLLERS.

DUTIES.—Supervise and direct the entire process of rolling and the changing of rolls. Is responsible for the condition of the plate as it leaves the rolls. In order to give the plate the proper width, the roller takes advantage of the fact that plate when rolled lengthens considerably in the direction of rolling, but does not widen to any appreciable extent at each pass. The slab is accordingly delivered on the roll table with the long side of the rectangle leading, and is given enough passes in this direction to lengthen the plate to almost the width desired. The roller gauges it after each pass with a long calibrated bar, which has mounted on it a slidable marker. When it

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reaches the proper dimension in the direction of rolling, the roller orders the "hookers" to give the slab a quarter turn, which brings the short side first, and the piece is then rolled back and forth until it is rolled down to the exact width and thickness required. During this period the roller gauges the thickness of the plate frequently with calipers. The roller, during the course of rolling, indicates to the screw man how much nearer the rolls should be brought together.

NATURE OF WORK.—This is a very responsible and highly skilled occupation, which requires a special knowledge of the working of iron and steel that can be gained only by long experience. It is impossible to convey in a description the kind and degree of knowledge required to produce uniform plates of the proper width and thickness on which the loss shall be as little as possible. The roller must be able to direct the heater when the slabs are not heated properly. There is no heavy manual labor required except during roll changes or when there is trouble in rolling.

SCREW MEN.

DUTIES.—Operate levers or wheel controlling hydraulic or electric mechanism actuating the screw by which the distance between the rolls is regulated. This mechanism is connected with a dial on which the distance between the rolls is indicated automatically.

NATURE OF WORK.—This is responsible work, requiring considerable experience. The screw man is signaled by the roller from time to time at what distance to keep the rolls, but the screw man is responsible for making the proper changes. His position is in a "pulpit" not far from the rolls and may be exposed to considerable heat, although in many establishments such arrangements are made that the heat is no greater than the general temperature of the mill.

MANIPULATORS.

See manipulators, page 158.

TABLE MEN.

(Including Hook Men; Hookers.)

DUTIES.—Their duties resemble very closely those of the table men described in blooming mills, page 159. They turn the slabs around when ordered by the roller and generally assist the manipulator. In many cases they perform the duties of the "scalers" shown below under "roll hands." They also frequently regulate the flow of water on the rolls.

NATURE OF WORK.—Their conditions of work are exactly analogous to that of the table men in blooming mills.

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ROLL HANDS.

(Including Salters; Sweep-offs; Scalers; Wrenchers; Water Tenders.)

DUTIES.—Include miscellaneous men required by the local conditions as well as the rather definite occupation of "scalers," whose duty is to remove the scale formed on the slab by heating so as to give a polished, smooth surface to the finished plate. This is done by two methods, which may be performed by the same man or two separate occupations may be carried—(*a*) salter, who throws salt on the slab, as described in connection with blooming mills, page 159, or (*b*) sweeper-off, who uses a heavy wire brush and rubs the scale off.

NATURE OF WORK.—The nature of the work and the skill required vary considerably, according to the exact duties performed. In general, however, the conditions under which the work is done are the same as those for hookers.

UNIVERSAL MILLS, 48-INCH.

ROLLERS.

DUTIES.—Duties and responsibilities are the same as for sheared-plate mills, the only difference being that the plate instead of being turned in order to give the proper width is rolled straight through with the same end first, the width being determined by the side rolls.

NATURE OF WORK.—Same as for rollers in sheared-plate mills.

SCREW MEN (MAIN ROLL).

(Including Screw Downs, Main Roll.)

DUTIES.—Same as for screw men, sheared-plate mills.

NATURE OF WORK.—Same as for screw men, sheared-plate mills.

SCREW MEN (SIDE ROLL).

(Including Screw Men, Vertical Rolls.)

DUTIES.—Operate the mechanism by which the distance between the two vertical rollers is regulated. The duties are otherwise the same as for the screw men (main roll).

NATURE OF WORK.—Same as for screw men (main roll), except that the work is easier, not requiring such close attention or such great accuracy.

ROLL HANDS.

DUTIES.—Same general class as roll hands, sheared-plate mills.

NATURE OF WORK.—Same conditions as for roll hands, sheared-plate mills.

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OTHER PLATE MILLS.

ROLLERS.

DUTIES.—Same general duties as on sheared-plate mills.

NATURE OF WORK.—Although the mills in this class are smaller, they are usually run at higher speed than the large mills described above, and even greater care must be exercised to get out a uniform product. Many of these mills are run tandem, and constant attention is required to keep them properly lined up.

SCREW MEN.

DUTIES.—The duties are analogous to those of screw men described above. On the smaller universal mills, this class includes the screw men on both the main and the side rolls.

NATURE OF WORK.—The conditions of work are the same as for screw men on other mills, except that the work usually moves faster.

ROLL HANDS.

DUTIES.—There is a wide diversity of duties around the rolls of these miscellaneous mills, required by local conditions, but they are in a general way the same as for other plate mills.

NATURE OF WORK.—The same conditions exist as are described above.

SHEARING AND LOADING.

GAUGERS.

DUTIES.—Inspect and gauge the plate as it cools on the roller table more carefully than the roller is able to do, or are employed on tandem and other plate mills of the same kind to gauge the plate between different passes.

NATURE OF WORK.—The work requires some judgment and considerable training. It is not heavy, nor is there much exposure to heat.

HOTBED MEN.

(Including Hotbed Lever Men; Hotbed Operators; Transfer Lever Men.)

DUTIES.—Operate levers by which the roller tables, which convey the plates from the rolls to the straightening machine and the shears, are controlled. The occupation may include a few men who guide and handle the plates on the hotbeds, as this work is not well standardized (differentiated).

NATURE OF WORK.—Conditions and nature of the work analogous to that of conveyor men in blooming mills.

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STRAIGHTENERS.

(Including Levelers; Straightening-Machine Operators; Bucklers.)

DUTIES.—Operate levers controlling the straightening machine. This machine consists of two sets of rolls, the upper set being placed so that the axis of each of its rolls is just above the line between a pair of the lower rolls. The position is like that given by placing the fingers of one hand on top of those of the other, so that the first finger of the upper hand rests on top and between the first and second fingers of the lower hand. The lower surface of the upper set is just enough below the upper surface of the lower set to create a pressure which will counteract any wrinkles or bulges that tend to form in the plate as it cools.

NATURE OF WORK.—Not very difficult nor highly skilled work. For some of the narrow plate, where less care needs to be exercised, the position is filled by boys.

LINE DRAWERS.

(Including Line-ups.)

DUTIES.—After the plate has been straightened, the line drawers use long wooden straightedges to rule chalk lines along the edge and at the end to guide the layer out and shearman.

NATURE OF WORK.—The work is simple, but must be done very accurately. The position is more or less one of training for the occupation of layer out.

LAYER OUT.

(Including Sketchers.)

DUTIES.—The layer out has the orders for plates to be shipped, on the basis of which he measures and rules off within the marks made by the line drawers the lines which are to guide the shearman in filling the order. In some plants this occupation is known as "marker."

NATURE OF WORK.—The position requires a very rapid, accurate man, with the long experience which enables him to get the greatest possible area of usable plates out of the plate as rolled.

SHEARMEN.

(Including Plate Shearmen; Shear Bosses; Rotary Shearmen; Head and Sketch Shearmen.)

DUTIES.—In the mills for sheared plates there are usually two sets of shears, one for "end shearing," in which the long piece of plate, as it comes from the rolls, is cut across at the proper point; the other, for "side shearing," takes the pieces as they come from the end shears

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and cuts them along the lines marked by the layer out. In either case the plate is run out from the roller conveyor on to large "casters," similar to bed casters, set on top of bars of equal length, which are fixed in the floor. The casters may be turned in any direction. The plate is moved along these casters, the shearman at one of the forward corners and the leader at the other, the plate being pushed by the shearman's helpers, who hold it with "dogs" (short iron bars with a slot in the end which fits over the edge of the plate). The shearman brings the line marked for shearing directly under the knife and directs the leader in bringing his corner to the proper point. Then at a signal from the shearman the shear lever man brings down the shear knife. The shearman is responsible for the condition of his shears and supervises the work of the entire shearing crew. Rotary shearmen operate rotary shears by which curved lines and other patterns for special shapes may be followed. There are also a few shearmen operating shears with specially shaped knives for producing parts of agricultural implements.

NATURE OF WORK.—The position requires considerable experience and a very accurate judgment. The responsibility is considerable, as the shearman by the slightest error may spoil a valuable plate. The shearman, moreover, has the supervision of a large crew of men, and it is his duty to oversee the work of the layers out, and if they are not getting the greatest possible amount of salable plate out of the material to instruct them how it should be done. The work of a shearman is comparatively heavy, and is usually done by men of good physique.

SHEARMEN'S HELPERS.

DUTIES.—Includes three grades of helpers: (*a*) "Leaders," who guide the plate on the casters and "line it up" at the mark where it is to be cut; (*b*) "shear lever men," who, at the direction of the shearman, pull the lever which operates the knife; (*c*) "shear laborers," who, as described above, pull the plate along on the casters and assist in handling the sheared plates; there are also "scrap men," who clean up the pieces of scrap made in shearing.

NATURE OF WORK.—The leaders are highly skilled men, who may be considered as being in training for shearmen. Except for the responsibility and supervisory duties, their work is of the same character as that of the shearmen. The work of the other helpers requires very little skill or experience, is not heavy, and is not done under any special conditions.

MARKERS, PAINTERS, AND STAMPERS.

DUTIES.—These three occupations are frequently combined, and are consequently reported here as a single duty. Markers have a list of the orders, locate and assign the proper plates to the orders, and

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make a record of the assignment. Painters paint the consignee's name and the plate size, etc., on the plate as directed by the marker. Stampers stamp the heat and numbers, and the weight, on each plate with a hammer and a set of steel dies.

NATURE OF WORK.—The work of the markers is almost purely clerical and supervisory. The painter is simply a "letterer." The stamper is comparatively unskilled.

CRANEMEN.

DUTIES.—Operate the cranes other than those used for charging and drawing furnaces. The cranes are chiefly electric and of small capacity; a large number of them are used in handling plates for shipping, etc.

NATURE OF WORK.—See cranemen, pages 161, 162.

ENGINEERS, STATIONARY; GREASERS, LABORERS, STOCKERS.

See corresponding occupations under blooming mills, pages 161, 162.

UNCLASSIFIED.

DUTIES.—Includes occupations required by special conditions, as well as some few in which the numbers were too small to be reported. (See blooming mills, page 163.)

NATURE OF WORK.—Includes all boys not reported under the occupations shown above.

EARNINGS AND HOURS AND DAYS OF WORK, BY OCCUPATIONS.

EARNINGS PER HOUR.

Data relative to earnings per hour for each occupation and each plant are shown in detail in Table I, Volume II, and for each occupation and each district in Table II. Table I shows for each plant separately customary number of working days per week, customary number of working hours per day, normal number of employees, average earnings per hour, and number of employees earning each classified amount per hour. Table II shows for each occupation and each district the number of plants reporting data, the number of employees included, and the average earnings per hour. The table is so arranged that a comparison is easily made of the earnings of time workers and of tonnage workers in the different occupations within each of the districts and also of the earnings of each of the two classes of workers in the several districts.

The tables here presented summarize the information concerning earnings. The table which follows is a summary of Table II, with the exception that time and tonnage workers are not shown separately but are combined. The data are shown only for the principal districts, as the number of employees in the other districts, as has already been noted, is too small to admit of comparison.

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AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS, COMBINED), BY PRINCIPAL DISTRICTS—PLATE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Occupations.	Eastern district.	Pittsburgh district.	Great Lakes and Middle West district.	Total, all districts.
Chargers:				
Plants	2	12	.....	14
Employees	14	111	.....	125
Average earnings per hour.....cents..	20.4	21.1	.....	21.1
Charging-crane and charging-machine operators:				
Plants	2	7	3	12
Employees	14	61	27	102
Average earnings per hour.....cents..	25.7	26.8	27.0	26.7
Cinder men:				
Plants	1	8	1	11
Employees	8	34	2	46
Average earnings per hour.....cents..	14.6	18.9	15.0	17.7
Cranemen:				
Plants	5	11	4	21
Employees	47	89	40	179
Average earnings per hour.....cents..	19.0	23.9	21.3	22.1
Door operators:				
Plants	6	12	3	22
Employees	30	73	10	117
Average earnings per hour.....cents..	9.8	13.9	10.9	12.0
Engineers, stationary:				
Plants	4	3	1	8
Employees	21	12	2	35
Average earnings per hour.....cents..	17.8	21.3	18.3	19.0
Gaugers:				
Plants	4	4	2	11
Employees	16	8	6	32
Average earnings per hour.....cents..	19.0	25.4	33.1	23.9
Greasers:				
Plants	1	8	3	12
Employees	6	48	12	66
Average earnings per hour.....cents..	16.6	19.9	18.8	19.5
Heaters:				
Plants	12	17	4	34
Employees	100	106	22	232
Average earnings per hour.....cents..	48.2	64.0	52.2	55.8
Heaters' helpers:				
Plants	11	16	3	31
Employees	178	186	22	402
Average earnings per hour.....cents..	24.4	28.5	29.3	26.2
Hotbed men:				
Plants	3	8	3	14
Employees	25	32	12	69
Average earnings per hour.....cents..	19.2	22.1	22.9	21.2
Laborers:				
Plants	10	15	4	30
Employees	227	374	130	737
Average earnings per hour.....cents..	14.5	16.5	15.8	15.8
Layers out:				
Plants	5	6	1	13
Employees	30	25	4	61
Average earnings per hour.....cents..	24.0	35.9	28.1	30.0
Line drawers:				
Plants	1	5	1	7
Employees	2	35	2	39
Average earnings per hour.....cents..	20.9	22.4	17.5	22.0
Manipulators, sheared-plate mills:				
Plants	4	7	2	13
Employees	11	28	4	43
Average earnings per hour.....cents..	27.3	31.6	32.5	30.6
Markers, painters, and stampers:				
Plants	4	11	3	18
Employees	32	109	20	161
Average earnings per hour.....cents..	18.3	25.1	25.2	23.9
Roll engineers:				
Plants	9	15	4	29
Employees	36	62	18	118
Average earnings per hour.....cents..	27.2	29.5	31.9	29.0
Rollers, sheared-plate mills:				
Plants	5	9	2	17
Employees	23	28	4	57
Average earnings per hour.....cents..	42.7	73.0	66.2	62.0
Rollers, universal mills, 48-inch:				
Plants	2	3	3	8
Employees	4	8	5	17
Average earnings per hour.....cents..	52.2	81.7	64.6	70.5

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AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY PRINCIPAL DISTRICTS—PLATE MILLS—Concluded.

Occupations.	Eastern district.	Pittsburgh district.	Great Lakes and Middle West district.	Total, all districts.
Rollers, other mills:				
Plants	8	11	2	21
Employees	29	37	4	70
Average earnings per hour...cents..	56.3	85.3	61.6	72.5
Roll hands, sheared-plate mills:				
Plants	2	8	.....	10
Employees	14	58	.....	72
Average earnings per hour...cents..	23.4	29.7	.....	28.4
Roll hands, universal mills, 48-inch:				
Plants	1	3	1	5
Employees	2	6	6	14
Average earnings per hour...cents..	39.2	23.4	30.4	28.6
Roll hands, other mills:				
Plants	6	11	2	19
Employees	66	203	7	276
Average earnings per hour...cents..	30.0	30.6	28.4	31.5
Screw men, sheared-plate mills:				
Plants	5	9	2	17
Employees	17	30	4	53
Average earnings per hour...cents..	33.6	43.5	44.2	40.1
Screw men, universal mills, 48-inch, main rolls:				
Plants	2	3	3	8
Employees	4	8	6	18
Average earnings per hour...cents..	36.0	44.1	46.6	43.2
Screw men, universal mills, 48-inch, side rolls:				
Plants	2	3	3	8
Employees	6	9	6	21
Average earnings per hour...cents..	27.5	28.4	36.2	30.4
Screw men, other mills:				
Plants	5	10	1	16
Employees	25	38	4	67
Average earnings per hour...cents..	47.7	38.5	34.2	34.6
Shearmen:				
Plants	11	15	4	31
Employees	60	112	36	213
Average earnings per hour...cents..	33.0	35.7	29.3	33.3
Shearmen's helpers:				
Plants	10	16	4	31
Employees	230	526	94	866
Average earnings per hour...cents..	21.1	22.6	20.9	21.9
Stockers:				
Plants	10	6	4	21
Employees	87	86	18	195
Average earnings per hour...cents..	21.0	19.0	19.2	19.7
Straighteners:				
Plants	6	11	4	22
Employees	42	69	16	129
Average earnings per hour...cents..	20.0	25.5	24.4	23.5
Table men:				
Plants	5	8	2	16
Employees	23	54	11	98
Average earnings per hour...cents..	19.4	29.2	28.2	27.0
Unclassified:				
Plants	11	15	4	31
Employees	151	218	70	463
Average earnings per hour...cents..	21.8	18.2	20.8	19.5

Of all the employees reported in the plate mills 55.52 per cent were in the Pittsburgh district, and 85.94 per cent were in that district and the Eastern district combined. The Great Lakes and Middle West district is represented by a smaller number of employees, and one other district is represented by so small a number of employees that it is included in the totals but is not shown separately. On account of the large numbers involved, comparison of occupations is best made in the Pittsburgh and Eastern districts. In almost every occupation the earnings are lower in the Eastern than in the Pittsburgh district. In many of the occupations the difference is only slight,

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but in some occupations—such, for instance, as heaters and laborers—there is considerable difference. The heaters in the Eastern district averaged 48.2 cents per hour and in the Pittsburgh district 64 cents per hour. The laborers averaged 14.5 cents per hour in the Eastern district and 16.5 cents per hour in the Pittsburgh district.

The next table compares the earnings of time-workers and tonnage workers. The number of employees employed as time-workers is only slightly less than the number employed as tonnage workers. In practically every occupation the tonnage workers have a higher average earning than do the time workers. The chargers, for instance, employed on the time basis averaged only 18.9 cents per hour, and those employed on the tonnage basis averaged 25 cents per hour. Charging-crane and charging-machine operators on the time basis averaged 21.4 cents per hour; on the tonnage basis, 31.2 cents per hour.

COMPARISON OF AVERAGE EARNINGS PER HOUR OF TIME-WORKERS AND OF TONNAGE WORKERS, BY OCCUPATIONS—PLATE MILLS.

Occupations.	Time.			Tonnage.			Time and tonnage combined.		
	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.
Chargers	8	77	$0.189	10	48	$0.250	14	125	$0.211
Charging-crane and charging-machine operators	8	54	.214	5	48	.312	12	102	.267
Cinder men	10	37	.162	2	9	.245	11	46	.177
Cranemen	18	116	.205	10	63	.254	21	179	.221
Door operators	21	105	.117	5	12	.141	22	117	.120
Engineers, stationary	8	29	.192	2	6	.180	8	35	.190
Gaugers	4	10	.161	8	22	.270	11	32	.239
Greasers	9	54	.198	4	12	.182	12	66	.198
Heaters	10	32	.509	26	200	.565	34	232	.558
Heaters' helpers	12	100	.232	23	302	.272	31	402	.262
Hotbed men	6	20	.203	9	49	.216	14	69	.212
Laborers	30	737	.158				30	737	.158
Layers out	4	10	.244	10	51	.311	13	61	.300
Line drawers	2	5	.149	5	34	.232	7	39	.220
Manipulators, sheared-plate mills	3	5	.256	11	38	.312	13	43	.306
Markers, painters, and stampers	13	57	.188	10	104	.268	18	161	.239
Roll engineers	22	73	.258	14	45	.341	29	118	.290
Rollers, sheared-plate mills	3	4	.587	14	53	.622	17	57	.620
Rollers, universal mills, 48-inch	2	4	.623	6	13	.726	8	17	.705
Rollers, other mill	8	18	.907	16	52	.666	21	70	.726
Roll hands, sheared-plate mills	4	10	.181	7	62	.298	10	72	.284
Roll hands, universal mills, 48-inch	2	4	.209	3	10	.318	5	14	.286
Roll hands, other mills	9	88	.244	14	188	.326	19	276	.315
Screw men, sheared-plate mills	3	5	.320	14	48	.410	17	53	.401
Screw men, universal mills, 48-inch, main rolls	3	8	.409	5	10	.448	8	18	.432
Screw men, universal mills, 48-inch, side rolls	3	9	.266	5	12	.332	8	21	.304
Screw men, other mills	5	15	.292	11	52	.444	16	67	.346
Shearmen	21	82	.233	22	131	.401	31	213	.333
Shearmen's helpers	28	309	.177	19	557	.242	31	866	.219
Stockers	16	116	.174	10	79	.234	21	195	.197
Straighteners	13	52	.206	13	77	.258	22	129	.235
Table men	4	11	.245	13	87	.273	16	98	.270
Unclassified	29	287	.173	16	176	.234	31	463	.196

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The table which follows shows for each principal occupation the number of establishments reporting, the normal number of employees, the average earnings per hour, and the per cent of employees earning each classified amount per hour. The occupations are in order following the process of manufacture.

PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS EARNING EACH CLASSIFIED AMOUNT PER HOUR, AND AVERAGE HOURLY EARNINGS—PLATE MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Heaters	34	232	$0.558	.....	.....	.....	.....	.....	.....	4.31	9.05	26.72	24.14	13.36	22.41
Heaters' helpers	31	402	.262	.....	2.99	3.48	6.22	4.98	28.11	26.37	21.39	6.47	.....	.....	.....
Roll engineers	29	118	.290	.....	.....	.....	.....	3.39	28.81	27.12	32.20	6.78	1.69	.....	.....
ROLLING CREWS.															
Sheared-plate mills:															
Rollers	17	57	.620	.....	.....	.....	.....	.....	17.54	.....	3.51	15.79	12.28	12.28	38.60
Screw men	17	53	.401	.....	.....	.....	.....	1.89	1.89	15.09	39.62	22.64	7.55	11.32	.....
Manipulators	13	43	.306	.....	.....	4.65	4.65	.....	30.23	9.30	27.91	23.26	.....	.....	.....
Table men	16	98	.270	.....	.....	4.08	4.08	14.29	23.47	18.37	31.63	4.08	.....	.....	.....
Roll hands, other	10	72	.284	.....	.....	8.33	8.33	16.67	2.78	13.89	38.89	8.33	2.78	.....	.....
Universal mills, 48-inch:															
Rollers	8	17	.705	.....	.....	.....	.....	.....	.....	.....	11.76	5.88	11.76	23.53	47.06
Screw men, main rolls	8	18	.432	.....	.....	.....	.....	.....	.....	.....	66.67	11.11	11.11	11.11	.....
Screw men, side rolls	8	21	.304	.....	.....	.....	.....	.....	38.10	14.29	38.10	9.52	.....	.....	.....
Roll hands, other	5	14	.286	.....	.....	.....	.....	14.29	14.29	14.29	57.14	.....	.....	.....	.....
Other plate mills:															
Rollers	21	70	.725	.....	.....	.....	.....	.....	.....	.....	4.29	11.43	20.00	24.29	40.00
Screw men	16	67	.346	.....	.....	.....	2.99	.....	2.99	17.91	26.87	11.94	28.36	8.96	.....
Roll hands, other	19	276	.315	.36	.....	5.43	4.35	5.80	19.57	12.32	31.52	11.59	6.88	2.17	.....
Shearmen	31	213	.333	.....	.94	7.04	1.41	3.76	16.43	19.72	23.00	10.33	9.86	4.69	2.82
Shearmen's helper	31	866	.219	.....	3.58	8.89	24.60	17.09	15.01	19.63	9.47	1.73	.....	.....	.....
Laborers	30	737	.158	.....	16.01	38.67	45.32	.....	.....	.....	.....	.....	.....	.....	.....
Other occupations	.....	1,819	.210	8.52	5.17	6.16	18.53	14.35	25.84	10.67	7.31	2.80	.33	.33	.....
Total, all occupations	34	5,193	.255	3.00	4.95	10.21	18.06	9.36	17.27	12.42	12.34	5.35	2.97	1.83	2.23

The 57 rollers in sheared-plate mills averaged 62 cents per hour; the lowest earning was 20 and under 25 cents, and 38.60 per cent of the employees earned 70 cents and over per hour. The 17 rollers in the 48-inch universal mills averaged 70.5 cents per hour; the lowest earning was 30 and under 40 cents per hour, and 47.06 per cent earned 70 cents and over per hour. The 70 rollers in other plate mills averaged 72.5 cents per hour; the lowest earnings for these rollers was 30 and under 40 cents per hour, and 40 per cent of them earned 70 cents and over per hour. The lowest paid employees are laborers. The 737 laborers averaged 15.8 cents per

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hour. Of the total number of laborers, 16.01 per cent earned 12 and under 14 cents per hour, 38.67 per cent earned 14 and under 16 cents, and 45.32 per cent earned 16 and under 18 cents per hour.

It may be noted that in the above table the entire rolling crews for each of the different types of mill are brought together in order that the working organization of each may be seen at a glance. It is interesting to note that except in the case of the rollers there is little difference between the wages paid in the different mills. The difference in favor of the rollers in "other mills" is largely to be attributed to the fact that a number of them are working 48 hours or less per week, which is compensated by a higher hourly rate.

The next table shows for each of the principal districts and for the total for all districts the number of plants reporting, the normal number of employees, average earnings per hour, and number of employees earning each classified amount per hour. Time-workers and tonnage workers are shown separately, and the two classes are also combined.

NUMBER OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, AND AVERAGE HOURLY EARNINGS, BY PRINCIPAL DISTRICTS—PLATE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Number of employees earning each classified amount per hour.										
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
TIME WORKERS.															
Eastern	12	494	$0.160	40	96	203	39	42	52	11	7	2	1	1	.....
Pittsburgh	17	1,490	.197	69	81	128	575	133	262	81	65	17	11	2	16
Great Lakes and Middle West	4	457	.211	8	6	88	136	64	99	35	28	5	12	6	.....
Total, all districts	34	2,543	.192	125	217	436	754	295	416	127	100	24	24	9	16
TONNAGE WORKERS.															
Eastern	10	1,086	.281	21	32	72	88	93	273	160	117	115	48	46	21
Pittsburgh	16	1,393	.337	10	4	14	94	95	192	320	365	112	80	31	76
Great Lakes and Middle West	3	137	.350	.....	.....	.....	2	3	16	28	49	27	2	8	2
Total, all districts	30	2,650	.316	31	40	94	184	191	481	518	541	254	130	86	100
TIME AND TONNAGE WORKERS.															
Eastern	12	1,580	.244	61	128	275	127	135	325	171	124	117	49	47	21
Pittsburgh	17	2,883	.266	79	85	142	669	278	454	401	430	129	91	33	92
Great Lakes and Middle West	4	624	.243	8	6	88	138	67	115	63	77	32	14	14	2
Total, all districts	34	5,193	.255	156	257	530	938	486	897	645	641	278	154	95	116

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The average earnings for the 2,543 employees on the time basis were 19.2 cents per hour, and for the 2,650 employees on the tonnage basis 31.6 cents per hour. The much higher earnings shown for tonnage workers than for time-workers is due in part to the fact that a greater proportion of the tonnage workers than of the time-workers are skilled employees and that all the unskilled laborers are time-workers. It is also due in part, however, as has been previously stated, to the fact that tonnage workers receive more than time-workers in practically every occupation in which employees are paid on both the time and tonnage basis.

The lowest rate reported was under 12 cents per hour, and this rate occurred in every district. The highest rate reported was in the group, $1.25 and over. Of all employees 7.03 per cent, as is shown in the succeeding table, earned 50 cents and over per hour, while 18.16 per cent earned less than 16 cents per hour. Of the total number of employees 18.06 per cent earned 16 and under 18 cents per hour, and 17.27 per cent earned 20 and under 25 cents per hour.

The table which follows shows the per cent of employees earning each classified amount per hour. Time workers and tonnage workers are combined. Only the principal districts are shown, although the total includes all employees in all the districts.

PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, AND AVERAGE HOURLY EARNINGS, BY PRINCIPAL DISTRICTS—PLATE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Eastern	12	1,580	$0.244	3.86	8.10	17.41	8.04	8.54	20.57	10.82	7.85	7.41	3.10	2.97	1.33
Pittsburgh	17	2,883	.266	2.74	2.95	4.93	23.20	9.64	15.75	13.91	14.92	4.47	3.16	1.14	3.19
Great Lakes and Middle West	4	624	.243	1.28	.96	14.10	22.12	10.74	18.43	10.10	12.34	5.13	2.24	2.24	.32
Total, all districts	34	5,193	.255	3.00	4.95	10.21	18.06	9.36	17.27	12.42	12.34	5.35	2.97	1.83	2.23

The proportion of employees earning less than 12 cents per hour was 3.86 per cent in the Eastern district, 2.74 per cent in the Pittsburgh district, 1.28 per cent in the Great Lakes and Middle West district, and 3 per cent of the total employees for all districts. The earnings were 14 and under 16 cents for 17.41 per cent of all employees in the Eastern district, 14.10 per cent of all employees in the Great Lakes and Middle West district, 4.93 per cent of all employees in the Pittsburgh district, and 10.21 per cent of all employees in all districts.

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A summary in the form of cumulative percentages which follows shows that 18.16 per cent of all employees earned less than 16 cents per hour, 45.58 per cent earned less than 20 cents per hour, and 75.27 per cent earned less than 30 cents per hour.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR—PLATE MILLS.

Earnings per hour.	Number of employees.	Per cent of total number of employees.	Earnings per hour.	Number of employees.	Per cent of total number of employees.
Under 14 cents	413	7.95	Under 25 cents	3,264	62.85
Under 16 cents	943	18.16	Under 30 cents	3,909	75.27
Under 18 cents	1,881	36.22	Under 40 cents	4,550	87.61
Under 20 cents	2,367	45.58	Under 50 cents	4,828	92.96

The per cent of employees earning less than each specified amount per hour in each of the principal districts is shown by means of cumulative percentages in the table which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY PRINCIPAL DISTRICTS—PLATE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning per hour—							
			Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
Eastern	1,580	$0.244	11.96	29.37	37.41	45.95	66.52	77.34	85.19	92.60
Pittsburgh	2,883	.266	5.69	10.62	33.82	43.46	59.21	73.12	88.04	92.51
Great Lakes and Middle West	624	.243	2.24	16.34	38.46	49.20	67.63	77.73	90.07	95.20
Total, all districts	5,193	.255	7.95	18.16	36.22	45.58	62.85	75.27	87.61	92.96

The average earnings per hour for the 5,193 employees in the 34 plate mills were 25.5 cents. Of the three principal districts the average earnings were lowest in the Great Lakes and Middle West district, only slightly higher in the Eastern district, and somewhat higher in the Pittsburgh district.

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working hours per week are presented in detail for each occupation and in each plant in Table I, Volume II of this report. These data are summarized in the text tables which follow. The first of these tables shows for each occupation the number of plants reporting, the normal number of employees, the average customary working hours per week, and the number of employees whose customary working time was each classified number of hours per week.

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NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, AND AVERAGE HOURS WORKED PER WEEK—PLATE MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Chargers	14	125	65.3	12	.....	6	13	75	15	.....	4	.....
Charging-crane and charging-machine operators	12	102	71.9	2	.....	.....	.....	30	60	.....	10	.....
Cinder men	11	46	68.9	.....	.....	.....	3	31	6	.....	6	.....
Cranemen	21	179	70.7	.....	.....	1	7	68	66	32	5	.....
Door operators	22	117	60.2	4	2	.....	2	56	43	.....	10	.....
Engineers, stationary	8	35	73.9	.....	.....	.....	1	14	5	6	9	.....
Gaugers	11	32	68.1	.....	.....	2	2	14	14	.....	.....	.....
Greasers	12	66	71.7	.....	.....	.....	.....	24	30	8	4	.....
Heaters	34	232	63.3	46	12	5	2	89	68	2	8	.....
Heaters' helpers	31	402	62.9	75	26	14	1	218	52	.....	16	.....
Hotbed men	14	69	68.1	.....	.....	.....	.....	47	22	.....	.....	.....
Laborers	30	737	66.8	.....	39	5	206	288	128	21	49	1
Layers out	13	61	67.1	1	.....	1	.....	51	8	.....	.....	.....
Line drawers	7	39	67.7	.....	.....	.....	.....	30	9	.....	.....	.....
Manipulators, sheared-plate mills	13	43	68.0	.....	.....	2	1	26	14	.....	.....	.....
Markers, painters, and stampers	18	161	68.3	.....	.....	2	7	107	40	.....	5	.....
Roll engineers	29	118	69.7	.....	.....	4	3	49	49	11	2	.....
Rollers, sheared-plate mills	17	57	66.7	3	.....	2	2	35	15	.....	.....	.....
Rollers, universal mills, 48-inch	8	17	68.2	.....	.....	.....	.....	13	4	.....	.....	.....
Rollers, other mills	21	70	58.1	22	8	2	5	20	11	.....	2	.....
Roll hands, sheared-plate mills	10	72	69.0	.....	.....	2	.....	42	28	.....	.....	.....
Roll hands, universal mills, 48-inch	5	14	68.6	.....	.....	.....	.....	8	6	.....	.....	.....
Roll hands, other mills	19	276	54.1	143	32	15	18	41	25	.....	2	.....
Screw men, sheared-plate mills	17	53	68.0	.....	.....	2	1	34	16	.....	.....	.....
Screw men, universal mills, 48-inch, main rolls	8	18	68.3	.....	.....	.....	.....	14	4	.....	.....	.....
Screw men, universal mills, 48-inch, side rolls	8	21	68.2	.....	.....	.....	.....	17	4	.....	.....	.....
Screw men, other mills	16	67	58.3	22	6	3	2	20	12	.....	2	.....
Shearmen	31	213	66.2	16	7	4	15	97	57	10	7	.....
Shearmen's helpers	31	866	67.2	26	24	21	31	496	252	.....	16	.....
Stockers	21	195	65.0	7	26	4	23	79	40	.....	16	.....
Straighteners	22	129	68.8	.....	4	6	2	74	30	.....	13	.....
Table men	16	98	68.1	.....	.....	2	3	62	31	.....	.....	.....
Unclassified	31	463	66.0	45	10	8	44	191	117	8	40	.....
Total, all occupations	34	5,193	66.0	424	196	113	394	2,460	1,281	98	226	1

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The table which follows shows for each of the principal occupations the per cent of employees customarily working each classified number of hours per week:

PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, AND AVERAGE HOURS WORKED PER WEEK—PLATE MILLS

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Heaters	34	232	63.3	19.83	5.17	2.16	0.86	38.36	29.31	0.86	3.45	.....
Heaters' helpers	31	402	62.9	18.66	6.47	3.48	.25	54.23	12.94	.....	3.98	.....
Roll engineers	29	118	69.7	.....	.....	3.39	2.54	41.53	41.53	9.32	1.69	.....
ROLLING CREWS.												
Sheared-plate mills:												
Rollers	17	57	66.7	5.26	.....	3.51	3.51	61.40	26.32	.....	.....	.....
Screw men	17	53	68.0	.....	.....	3.77	1.89	64.15	30.19	.....	.....	.....
Manipulators	13	43	68.0	.....	.....	4.65	2.33	60.47	32.56	.....	.....	.....
Table men	16	98	68.1	.....	.....	2.04	3.06	63.27	31.63	.....	.....	.....
Roll hands, other	10	72	69.0	.....	.....	2.78	.....	58.33	38.89	.....	.....	.....
Universal mill, 48-inch:												
Rollers	8	17	68.2	.....	.....	.....	.....	76.47	23.53	.....	.....	.....
Screw men, main rolls	8	18	68.3	.....	.....	.....	.....	77.78	22.22	.....	.....	.....
Screw men, side rolls	8	21	68.2	.....	.....	.....	.....	80.95	19.05	.....	.....	.....
Roll hands, other	5	14	68.6	.....	.....	.....	.....	57.14	42.86	.....	.....	.....
Other plate mills:												
Rollers	21	70	58.1	31.43	11.43	2.86	7.14	28.57	15.71	.....	2.86	.....
Screw men	16	67	58.3	32.84	8.96	4.48	2.99	29.85	17.91	.....	2.99	.....
Roll hands, other	19	276	54.1	51.81	11.59	5.43	6.52	14.86	9.06	.....	.72	.....
Shearmen	31	213	66.2	7.51	3.29	1.88	7.04	45.54	26.76	4.69	3.29	.....
Shearmen's helpers	31	866	67.2	3.00	2.77	2.42	3.58	57.27	29.10	.....	1.85	.....
Laborers	30	737	66.8	.....	5.29	.68	27.95	39.08	17.37	2.85	6.65	0.14
Other occupations	.....	1,819	67.9	3.90	2.31	1.65	5.72	48.98	27.76	2.97	6.71	.....
Total, all occupations	34	5,193	66.0	8.16	3.77	2.18	7.59	47.37	24.67	1.89	4.35	.02

In several of the skilled occupations, such as heaters and rollers, some of the employees work 48 hours and under per week. The proportion working 48 hours and under was as follows: Heaters, 19.83 per cent; heaters' helpers, 18.66 per cent; rollers in sheared-plate mills, 5.26 per cent; rollers in universal mills, 48-inch, none; rollers in other plate mills, 31.43 per cent. These occupations, it may be noted, include only the most highly skilled employees, who by virtue of the demand for their services are able to obtain shorter hours. By reference to Table I, Volume II of this report, it will be seen that all of the employees in the "other mills" who worked 48 hours or less per week were in three plants.

The summary which follows shows the per cent of employees whose customary working time was 72 hours and over per week, and also the per cent whose customary working time was 84 hours and over per week. The summary is in cumulative form; that is, employees working 84 hours and over are included in the column working 72 hours and over.

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PER CENT OF EMPLOYEES IN THE PRINCIPAL OCCUPATIONS CUSTOMARILY WORKING 72 HOURS AND OVER PER WEEK—PLATE MILLS.

Occupations.	Normal number of employees.	Per cent of employees whose customary working hours per week were—	
		72 and over.	84 and over.
Heaters	232	33.62	3.45
Heaters' helpers	402	16.92	3.98
Roll engineers	118	52.54	1.69
ROLLING CREWS.			
Sheared-plate mills:			
Rollers	57	26.32	.....
Screw men	53	30.19	.....
Manipulators	43	32.56	.....
Table men	98	31.63	.....
Roll hands, other	72	38.89	.....
Universal mills, 48-inch:			
Rollers	17	23.53	.....
Screw men, main rolls	18	22.22	.....
Screw men, side rolls	21	19.05	.....
Roll hands, other	14	42.86	.....
Other plate mills:			
Rollers	70	18.57	2.86
Screw men	67	20.90	2.99
Roll hands, other	276	9.78	.72
Shearmen	213	34.74	3.29
Shearmen's helpers	866	30.95	1.85
Laborers	737	27.01	6.79
Other occupations	1,819	37.44	6.71
Total, all occupations	5,193	30.93	4.37

The next table is a summary showing the number of employees customarily working each classified number of hours per week. The time workers and tonnage workers are shown separately.

NUMBER OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK, BY PRINCIPAL DISTRICTS—PLATE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	Over 56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
TIME WORKERS.												
Eastern	12	494	62.1	28	65	32	143	148	50	16	11	1
Pittsburgh	17	1,490	67.9	61	47	26	204	656	289	70	137	.....
Great Lakes and Middle West	4	487	71.4	.....	.....	.....	14	72	393	.....	8	.....
Total, all districts	34	2,543	67.3	89	114	58	368	939	732	86	156	1
TONNAGE WORKERS.												
Eastern	10	1,086	61.3	174	64	47	.....	788	13	.....	.....	.....
Pittsburgh	16	1,393	69.8	161	18	8	25	672	445	6	58	.....
Great Lakes and Middle West	3	137	72.7	.....	.....	.....	.....	28	91	6	12	.....
Total, all districts	30	2,650	64.8	335	82	55	26	1,521	549	12	70	.....
TIME AND TONNAGE WORKERS.												
Eastern	12	1,580	61.5	202	129	79	143	936	63	16	11	1
Pittsburgh	17	2,883	67.3	222	65	34	229	1,328	734	76	195	.....
Great Lakes and Middle West	4	624	71.7	.....	.....	.....	14	100	484	6	20	.....
Total, all districts	34	5,193	66.0	424	196	113	394	2,460	1,281	98	226	1

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The average customary time worked for all time workers was 67.3 hours, for all tonnage workers 64.8 hours, and for the total of all employees 66 hours. The difference in favor of the tonnage workers is due in large part to the fact pointed out above, that the more highly skilled employees who are paid on a tonnage basis have in a few cases been able to secure an 8-hour day.

The table which follows shows for time workers and tonnage workers combined the per cent of employees customarily working each classified number of hours in three principal districts. The totals for all districts are placed in comparison.

PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, AND AVERAGE HOURS WORKED PER WEEK, BY PRINCIPAL DISTRICTS—PLATE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Eastern	12	1,580	61.5	12.78	8.16	5.00	9.05	59.24	3.99	1.01	0.70	0.06
Pittsburgh	17	2,883	67.3	7.70	2.25	1.18	7.94	46.06	25.46	2.64	6.76	.....
Great Lakes and Middle West	4	624	71.7	.....	.....	.....	2.24	16.03	77.56	.96	3.21	.....
Total, all districts	34	5,193	66.0	8.16	3.77	2.18	7.59	47.37	24.67	1.89	4.35	.02

The customary working hours were 72 and over for 30.93 per cent of all employees in the total for all districts, and for 81.73 per cent of the total employees in the Great Lakes and Middle West district, 34.86 per cent of all employees in the Pittsburgh district, and 5.76 per cent of all employees in the Eastern district. The differences in hours worked which exist between the different districts are very striking, particularly as regards the proportion working less than 60 hours per week.

The average customary working time per week for the 5,193 employees was 66 hours. The customary working time was over 60 and under 72 hours per week for 47.37 per cent of all employees and 72 hours per week for 24.67 per cent; 14.11 per cent worked less than 60 hours per week.

DAYS WORKED PER WEEK.

Under each occupation the customary working days or turns per week are shown for each plant in Table I, Volume II of this report. These data are briefly summarized here. The table which follows

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shows for each occupation the number of plants reporting, the normal number of employees, and the number whose customary working time was each specified number of days or turns:

NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK—PLATE MILLS.

Occupations.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Chargers	14	125	.....	34	87	.....	4
Charging-crane and charging-machine operators	12	102	.....	2	90	.....	10
Cinder men	11	46	2	17	21	.....	6
Cranemen	21	179	.....	31	111	32	5
Door operators	22	117	.....	25	82	.....	10
Engineers, stationary	8	35	1	6	13	6	9
Gaugers	11	32	.....	8	24	.....	.....
Greasers	12	66	.....	8	42	12	4
Heaters	34	232	.....	89	133	2	8
Heaters' helpers	31	402	.....	130	256	.....	16
Hotbed men	14	69	.....	26	43	.....	.....
Laborers	30	737	4	26	[1]611	21	75
Layers out	13	61	.....	16	45	.....	.....
Line drawers	7	39	.....	4	35	.....	.....
Manipulators, sheared-plate mills	13	43	.....	8	35	.....	.....
Markers, painters, and stampers	18	161	.....	22	134	.....	5
Roll engineers	29	118	.....	26	78	10	4
Rollers, sheared-plate mills	17	57	1	12	44	.....	.....
Rollers, universal mills	8	17	.....	4	13	.....	.....
Rollers, other mills	21	70	4	28	36	.....	2
Roll hands, sheared-plate mills	10	72	.....	12	60	.....	.....
Roll hands, universal mills, 48-inch	5	14	.....	4	10	.....	.....
Roll hands, other mills	19	276	.....	115	159	.....	2
Screw men, sheared-plate mills	17	53	.....	10	43	.....	.....
Screw men, universal mills, 48-inch main rolls	8	18	.....	4	14	.....	.....
Screw men, universal mills, 48-inch, side rolls	8	21	.....	4	17	.....	.....
Screw men, other mills	16	67	.....	39	26	.....	2
Shearmen	31	213	.....	57	148	.....	8
Shearmen's helpers	31	866	.....	176	674	.....	16
Stockers	21	195	.....	38	141	.....	16
Straighteners	22	129	.....	23	93	.....	13
Table men	16	98	.....	16	82	.....	.....
Unclassified	31	463	1	166	248	8	40
Total, all occupations	34	5,193	13	1,186	[1]3,648	91	255

[1] Including 6 employees who worked alternately 5 and 7 days per week.

The customary working time per week was 6 days or turns for 3,648 employees, or 70.25 per cent of the 5,193 employees reported in the special iron and steel occupations in the plate-mill plants. The customary working time per week was 5 and 6 turns alternately for 1,186 employees, or 22.84 per cent of the total, and 7 days or turns for 255 employees, or 4.91 per cent of the total.

The table which follows shows for each of the principal occupations the per cent of employees customarily working each specified number of days or turns per week. The occupations are presented according to the order of processes of manufacture.

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PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK—PLATE MILLS.

Occupations.	Number of plants.	Normal number of employees.	Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Heaters	34	232	.....	38.36	57.33	0.86	3.45
Heaters' helpers	31	402	.....	32.34	63.68	.....	3.98
Roll engineers	29	118	.....	22.03	66.10	8.47	3.39
ROLLING CREWS.							
Sheared-plate mills:							
Rollers	17	57	1.75	21.05	77.19	.....	.....
Screw men	17	53	.....	18.87	81.13	.....	.....
Manipulators	13	43	.....	18.60	81.40	.....	.....
Table men	16	98	.....	16.33	83.67	.....	.....
Roll hands, other	10	72	.....	16.67	83.33	.....	.....
Universal mills, 48-inch:							
Rollers	8	17	.....	23.53	76.47	.....	.....
Screw men, main rolls	8	18	.....	22.22	77.78	.....	.....
Screw men, side rolls	8	21	.....	19.05	80.95	.....	.....
Roll hands, other	5	14	.....	28.57	71.43	.....	.....
Other plate mills:							
Rollers	21	70	5.71	40.00	51.43	.....	2.86
Screw men	16	67	.....	58.21	38.81	.....	2.99
Roll hands, other	19	276	.....	41.67	57.61	.....	.72
Shearmen	31	213	.....	26.76	69.48	.....	3.76
Shearmen's helpers	31	866	.....	20.32	77.83	.....	1.85
Laborers	30	737	.54	3.53	[1] 82.90	2.85	10.18
Other occupations	.....	1,819	.22	23.42	66.47	3.19	6.71
Total, all occupations	34	5,193	.25	22.84	[1] 70.25	1.75	4.91

[1] Including 6 employees who worked alternately 5 and 7 days.

A larger proportion of laborers than of employees in any other occupation worked 7 days or turns per week; in that occupation 10.18 per cent of the employees customarily worked 7 days or turns. There was practically no difference between the other occupations in the same type of mill.

The table which follows compares the total for each of the principal districts as far as customary working days or turns are concerned:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Eastern	12	1,580	.....	671	[1] 880	15	14	.....	42.47	[1] 55.70	0.95	0.89
Pittsburgh	17	2,883	12	418	2,162	70	221	0.42	14.50	74.99	2.43	7.67
Great Lakes and Middle West	4	624	.....	.....	598	6	20	.....	.....	95.83	.96	3.21
Total, all districts	34	5,193	13	1,186	[1] 3,648	91	255	.25	22.84	[1] 70.25	1.75	4.91

[1] Including 6 employees who worked alternately 5 and 7 days.

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STANDARD RAIL MILLS.

INTRODUCTION.

The data relative to earnings and hours of work are summarized briefly in the pages immediately following and analyzed in more detail on pages 211 to 223.

SUMMARY OF EARNINGS AND HOURS AND DAYS OF WORK.

EARNINGS.

Data relative to earnings in standard rail mills were reported for 3,584 employees in special iron and steel occupations in 10 plants. Of the total employees 51.06 per cent were in the Great Lakes and Middle West district, and for the reason that this industry is largely localized in that district and so few employees are therefore included in other districts, the data by districts will not be discussed.

Of the 3,584 employees included in this report on standard rail mills, 26.84 per cent earned 16 and under 18 cents per hour, 19.39 per cent earned 20 and under 25 cents per hour, and 14.34 per cent earned 14 and under 16 cents per hour. The average earnings per hour of all employees, both skilled and unskilled, were 22.8 cents.

The per cent of employees, earning each classified amount per hour in all districts and in each of the three principal districts is presented in the table which follows:

PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY PRINCIPAL DISTRICTS—STANDARD RAIL MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.								
			Under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 cents and over.
Eastern	749	$0.205	19.62	30.17	3.60	4.41	20.29	3.34	7.48	6.68	4.41
Pittsburgh	716	.228	4.61	7.82	35.75	5.03	14.53	11.45	10.34	8.94	1.54
Great Lakes and Middle West	1,830	.235	1.97	6.89	36.78	9.73	19.84	7.32	5.41	4.04	8.04
Total, all districts	3,584	.228	6.75	14.34	26.84	7.84	19.39	7.17	6.64	5.27	5.74

The summary which follows presents data for all districts and also for the Great Lakes and Middle West district. This summary is in the form of cumulative percentages and shows that 21.09 per cent of the total employees earned under 16 cents per hour, 47.93 per cent earned under 18 cents per hour, and about three-fourths, or 75.16 per cent, earned less than 25 cents per hour. The Great Lakes and Middle West district forms such a large proportion of the total number that the percentages for that district practically parallel the per-

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centages for all districts with the exception of the lower wage classifications, the percentages of employees earning under 16 cents per hour being 8.85 per cent in the Great Lakes and Middle West district as against 21.09 in the total for all districts.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR IN GREAT LAKES AND MIDDLE WEST DISTRICT AND IN ALL DISTRICTS—STANDARD RAIL MILLS.

Earnings per hour.	Great Lakes and Middle West district.		All districts.	
	Number of employees.	Per cent of total number of employees.	Number of employees.	Per cent of total number of employees.
Under 14 cents	36	1.97	242	6.75
Under 16 cents	162	8.86	756	21.09
Under 18 cents	835	45.64	1,718	47.93
Under 20 cents	1,013	55.37	1,999	55.77
Under 25 cents	1,376	75.21	2,694	75.16
Under 30 cents	1,510	82.53	2,951	82.33
Under 40 cents	1,609	87.94	3,189	88.97
Under 50 cents	1,683	91.98	3,378	94.24

HOURS OF LABOR.

The customary working hours per week were reported for 3,584 employees in the special iron and steel occupations in 10 standard rail mills. Seventy-two hours per week was the customary working time for 59.21 per cent of all employees, and 17.41 per cent customarily worked 84 hours per week. The total per cent working 72 hours and over per week was 76.95. These figures indicate that more than three-fourths of the employees engaged in the actual producing occupations in this department worked 12 hours a day or over, and it will also be noted that more than one-sixth of all employees, 17.41 per cent, worked 84 hours per week, which indicates a 12-hour day for the entire 7 days a week.

The per cent of employees working each classified number of hours per week for the Great Lakes and Middle West district and for all districts are shown in the following table:

PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK IN GREAT LAKES AND MIDDLE WEST DISTRICT AND IN ALL DISTRICTS—STANDARD RAIL MILLS.

Districts.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—			
			48 and under.	56 and under 72.	72 and under 84.	84.
Great Lakes and Middle West	1,830	74.8	5.57	11.48	55.90	27.05
Total, all districts	3,584	72.5	5.08	17.97	59.54	17.41

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In the above table the total for all districts shows that the average hours per week was 72.5, and for the Great Lakes and Middle West district 74.8 hours. Seventy-two hours per week and over was the customary working time for 76.95 per cent of all employees and 84 hours per week for 17.41 per cent of all employees. In the Great Lakes and Middle West district 72 hours per week and over was the customary working time for 82.95 per cent of all employees and 84 hours per week for 27.05 per cent of all employees.

DAYS PER WEEK.

The customary working time for 71.21 per cent of the total number of employees in the special iron and steel occupations in the standard-rail-mill plants was 6 days or turns per week. Seven days or turns per week was the customary working time for 17.80 per cent of the 3,584 employees in all districts, and for 27.21 per cent of the 1,830 employees in the Great Lakes and Middle West district, 5 and 6 days or turns per week, alternating, was the customary working time for 10.88 per cent of all employees. A comparison of the tables showing the number of days or turns per week and the number of hours customarily worked per week shows that practically all of the employees who worked 7 days or turns per week worked in effect a 12-hour shift for the 7 days a week.

It is important in considering the figures showing the percentage of employees in this department working 7 days a week to remember that the occupations here reported do not include the employees working on repairs and whose services are, therefore, required when the rail mills are not in operation. The occupations here covered include only those directly connected with productive processes. It can not be claimed that there is any necessity requiring the work in the rail mills to be carried on continuously. Practically the only employees for whom it may be claimed that there is a necessity for Sunday work are those who are members of the rolling crew who sometimes have a few hours' work repairing rolls, the repair work on the rolls being done by the roll crew rather than the regular repair men. These would form but a very small percentage of the total number of employees, and the per cent shown as working 84 hours a week is due to the fact that some of the rail mills, at the time of the investigation, were being operated for 7 days per week.

DESCRIPTION OF OCCUPATIONS.

In the following description of occupations, the main occupation name represents the term retained in the report and under which data as to wages and hours of labor are presented. The names shown in parenthesis represent the most important minor occupations in-

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cluded under the name used in this report as well as other terms used in various establishments to indicate the same class of work. In the first paragraph, "Duties," is given a description of the functions which employees in the occupation perform and the method by which the work is done. In the second paragraph, "Nature of work," two points are covered, first an indication of the type of workman required for the position and, second, the conditions under which the work is done. The occupations are presented in the order of the processes of manufacture.

HEATERS.

DUTIES.—As many rail mills include a blooming mill as an integral part of their equipment, which requires "soaking pits," while others use only "reheating furnaces," it will be necessary to see the description for heaters, pages 147 and 154.

CHARGING-MACHINE OPERATORS.

DUTIES.—Charge blooms into reheating furnace, using various types of charging machines. One of the commoner types is similar to that described above for the open-hearth department, except that instead of picking the bloom up, the machine pushes it from a truck into the furnace. Pit (charging and drawing) cranemen are included below with cranemen.

NATURE OF WORK.—See charging-crane and charging machine operators, page 182.

DOOR OPERATORS.

See door operators, page 183.

ROLL ENGINEERS.

DUTIES.—See roll engineers, page 157. Includes both engineers on "reversing" and "nonreversing" engines, but very few of the former, as most mills are "three high."

ROLLERS.

DUTIES.—The roller's duties are almost entirely supervisory, that is, he does not control the operation of a set of rolls as in blooming mills. He is in general charge of the rolling and of all roll changes and makes frequent inspections to see that everything is going right; has the product gauged frequently to see that the section is rolled true to size, and if it is off he sees that the necessary changes are made to line the mill up properly.

NATURE OF WORK.—The roller is valued chiefly for his practical knowledge of the mechanical working of steel and for his ability to set up and maintain his mill in proper running order. The position

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demands a very high degree of skill and knowledge, which can not be obtained outside the mill. The roller, although performing little manual labor, is kept busy constantly and must be on the alert every minute. His hardest work comes when there is some trouble with the mill.

ROLLERS' HELPERS.

(Including Assistant Rollers.)

DUTIES.—The rollers' duties are so varied, and the area covered by the modern rail mill is so large, that they are, in the majority of plants, given one or more assistants, who watch various parts of the process particularly and assist the rollers generally in all the work. The rollers' helpers often spell others of the rolling crew, most frequently the finishers.

NATURE OF WORK.—The nature of the helpers' work depends entirely on the duties assigned by the roller and on what occupation they are set to spell. In general, however, they are not exposed to extreme heat except for short periods. The position is rather directly in line of promotion to roller.

TABLE LEVER MEN.

(Including Manipulators; Iron Men.)

DUTIES.—Operate the tables, raising and lowering the ingots and blooms for the rolls, and the various forms of manipulators used in turning the pieces so that they will enter the passes properly. See manipulators, page 158.

NATURE OF WORK.—See manipulators, page 159. The rails must enter the rolls much more exactly than in the case of blooming mills, and this position, therefore, requires a much more highly skilled man.

TABLE MEN.

See table men, page 159.

GUIDE SETTERS.

DUTIES.—Set in place on the various stands of rolls the iron guides, by which the partly finished rail is made to enter the "pass" between the rolls at the proper angle, and inspect them to see that they are kept in proper position. In some plants combine another function, such as operating one of the approach tables. Assist the rollers in roll changes.

NATURE OF WORK.—The work requires a high degree of mechanical skill and a great deal of practical experience. The guide frequently needs adjusting while the rolls are still very hot, in which case the work is rendered hard by reason of the heat.

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SAW MEN, HOT.

DUTIES.—Operate levers controlling the large circular saw by which the rails are sawed as they leave the finishing pass. In many plants it is arranged that the saw man and his gauger should spell each other. The saw men see that the gauges are properly set, and if a "gang saw" (i. e., one in which two or more saws set apart the length of a rail are made to cut simultaneously) is used, the saw men must see that they are properly set.

NATURE OF WORK.—The work does not require a very great deal of experience. The position, however, is exposed to considerable heat and the work is continuous whenever the mill is in operation.

SAW MEN'S HELPERS, HOT.

(Including Butt Pullers; Butt Catchers; Gaugers.)

DUTIES.—Includes chiefly "butt pullers," who drag away the short ends sawed off the rail, but also includes the "gauger," who operates levers dropping the stop which puts the rail in the proper position for sawing.

NATURE OF WORK.—Unskilled work for the most part, and does not require much heavy manual labor. The men are, however, exposed to considerable heat. See shearmen's helpers, page 160.

STAMPERS.

See stampers, page 161.

HOTBED LEVER MEN.

DUTIES.—Operate levers controlling various forms of transfers by which rails are carried along on hotbeds.

NATURE OF WORK.—Unskilled work, requiring comparatively little experience. See conveyor men, page 160.

HOTBED MEN.

(Including Cooling-bed Men; Hot-dogs Men; Hotbed Greasers.)

DUTIES.—Grease the tops of the rails which make up the hotbed, and turn the rails over from time to time so that they will cool evenly and thus be as straight as possible when cool. In turning the rails they use a tool called a "dog," which is very much like a large wrench.

NATURE OF WORK.—Unskilled work, but very hot, and in fact very heavy manual labor.

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STRAIGHTENERS, GAG PRESS.

DUTIES.—Although automatic presses have been introduced, the bulk of the heavy steel rails are still straightened by means of gag presses. The "gag press" is a large press machine having a bed into which rollers are set so that the rail can be easily pushed along over it. Above this bed is the press proper, which is so arranged that it can be brought down to any required distance by the pressure of the gagger's foot on a pedal, or otherwise. In straightening rails the straightener, assisted by one of his helpers, swings the rail onto the bed. The straightener then sights along the head of the rail from one end toward a light (very much like an engine headlight) at the other end of the rail. Any bend in the rail is readily detected, and the straightener moves the rail along over the bed until the center of the curve is directly under the press. He then signals the gagger, who puts a block held by a handle (the "gag") under the press block. If the piece is not entirely straight the gag, which is slightly tapered, is slipped further under, and this is repeated until this and all other curves are straightened.

NATURE OF WORK.—This work, in addition to being very heavy manual labor, requires a great deal of skill and experience that can be obtained only in the mill. Many attempts have been made to substitute automatic straightening presses, but the results are not as uniform as in the older process. The "gag-press" method has remained unchanged for a long time, except that the presses are now made larger and stronger in order to accommodate the heavy rails of the present day. This has made the straightener's work heavier, but as the lighter rails are handled much more rapidly it is doubtful if the expenditure of energy is so great as when lighter rails were handled.

STRAIGHTENERS' HELPERS (GAGGERS).

DUTIES.—See straighteners, gag press, above.

NATURE OF WORK.—Requires some experience, but chiefly an alert mind that will carry out the straightener's directions and signals quickly and easily. Is not heavy work, but demands constant attention.

STRAIGHTENERS' HELPERS, OTHER.

(Including Swingers-Down.)

DUTIES.—Assist straightener in handling rails. See straighteners, gag press, above.

NATURE OF WORK.—Relatively unskilled work, but very heavy.

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CHIPPERS.

DUTIES.—Remove the burr left on the end of the rail when it is sawed. For this work use a cold chisel and hammer, although in some cases a pneumatic chipping tool, which operates on the same principle as a pneumatic hammer, is used. Also remove any small flaws left in rolling that do not go below the surface. The chipping of the rail end is eliminated in some establishments by the use of an "ending machine," essentially a vertical milling machine, which mills the end of the rail perfectly true.

NATURE OF WORK.—The position requires some skill and experience if the work is to be done expeditiously. A number of managers consider it a more satisfactory and economical method than the use of the more modern machines, such as the ending machine.

DRILLERS AND PUNCHERS.

DUTIES.—The larger number included under this head are drillers and operate an automatic drill press which drills the rivet holes in the web of the rail. The drill presses usually carry two or more drills and form the required number of holes at one point at a single operation. The "punch press," which is used for most structural material and light rails, can not be used on the heavy rails. The duties are similar on the two machines.

NATURE OF WORK.—The work is comparatively simple as the drills are ordinarily set by a foreman or a drill gauger, so that all that the driller has to do is to shift the rail to the proper point as indicated by points made through a template, then bring the lever down or turn the wheel that sets his drill in motion. The drill reverses automatically before it reaches the bedplate of the press. Much of the handling of the rails is heavy work.

INSPECTORS.

DUTIES.—Inspect the finished rail in accordance with the specifications for the particular order and the customs of the individual mill. A preliminary inspection is given before straightening, but the chief inspection follows when the finished rails are ready for shipping. Rails are classed as "firsts," "seconds," and "thirds," and a number are sent to be cold sawed to a shorter length.

NATURE OF WORK.—Varies entirely with the class of product of the particular mill and the care with which the mill inspects its own product.

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SAW MEN, COLD.

DUTIES.—Operate levers controlling saws which cut defective rails to shorter and salable lengths.

NATURE OF WORK.—This work is not done nearly so rapidly as hot sawing, nor does it require as careful a man. As the rail lengths to be cut vary, there is a constant change of the gauge. The work consists largely in supervising the helpers who handle the rails and operating the saw levers.

SAW MEN'S HELPERS, COLD.

DUTIES.—Handle the rails for the cold saw and clean up scrap.

NATURE OF WORK.—Comparatively unskilled, but heavy manual labor.

CONVEYOR MEN; CRANEMEN; GREASERS; LABORERS; UNCLASSIFIED.

See same occupations, pages 160 to 163.

EARNINGS AND HOURS AND DAYS OF WORK, BY OCCUPATION.

EARNINGS PER HOUR.

Data relative to earnings per hour for each occupation and each plant are shown in detail in Table I, Volume II, and for each occupation and each district in Table II. Table I shows for each plant separately customary number of working days per week, customary number of working hours per day, normal number of employees, average earnings per hour, and number of employees earning each classified amount per hour. Table II shows for each occupation and each district the number of plants reporting data, the number of employees included, and the average earnings per hour. The table is so arranged that a comparison is easily made of the earnings of time workers and of tonnage workers in the different occupations within each of the districts and also of the earnings of each of the two classes of workers in the several districts.

The tables here presented summarize the information concerning earnings. The table which follows is a summary of Table II, with the exception that time workers and tonnage workers are not shown separately but are combined. The data are shown only for the principal districts as the number of employees in the other districts, as has already been noted, is too small to admit of comparison.

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AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY PRINCIPAL DISTRICTS—STANDARD RAIL MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Occupations.	Eastern district.	Pittsburgh district.	Great Lakes and Middle West district.	Total, all districts.
Charging-machine operators:				
Plants	1	2	1	5
Employees	5	20	6	32
Average earnings per hour...cents..	23.4	23.0	22.6	22.9
Chippers:				
Plants	1	2	5	9
Employees	25	38	126	22.3
Average earnings per hour...cents..	34.4	25.5	22.6	22.8
Conveyor men:				
Plants	.....	2	5	7
Employees	.....	12	22	34
Average earnings per hour...cents..	.....	16.0	16.6	16.4
Cranemen:				
Plants	2	2	5	10
Employees	13	9	47	73
Average earnings per hour...cents..	21.4	19.6	31.6	28.6
Door operators:				
Plants	1	1	4	6
Employees	6	8	31	45
Average earnings per hour...cents..	11.1	10.0	11.5	11.2
Drillers and punchers:				
Plants	2	2	5	10
Employees	49	46	160	293
Average earnings per hour...cents..	26.0	22.9	21.4	22.0
Engineers, stationary:				
Plants	1	2	3	6
Employees	10	10	26	46
Average earnings per hour...cents..	22.2	18.1	20.3	20.1
Greasers:				
Plants	1	2	5	9
Employees	3	20	64	93
Average earnings per hour...cents..	14.8	18.9	17.7	17.8
Guide setters:				
Plants	1	2	4	8
Employees	5	7	15	36
Average earnings per hour...cents..	41.9	38.9	46.4	40.8
Heaters:				
Plants	1	2	5	9
Employees	2	16	33	53
Average earnings per hour...cents..	35.9	40.9	58.7	51.6
Heaters' helpers:				
Plants	1	2	5	8
Employees	8	13	40	61
Average earnings per hour...cents..	26.2	31.5	23.5	25.6
Hotbed lever men:				
Plants	2	2	5	10
Employees	8	14	30	60
Average earnings per hour...cents..	13.9	19.2	21.7	19.7
Hotbed men:				
Plants	2	2	5	10
Employees	17	14	40	77
Average earnings per hour...cents..	15.5	19.3	16.9	17.0
Inspectors:				
Plants	2	1	5	9
Employees	38	6	93	150
Average earnings per hour...cents..	19.1	21.3	22.8	22.5
Laborers:				
Plants	2	2	5	10
Employees	315	173	473	1,053
Average earnings per hour...cents..	13.8	16.4	16.4	15.8
Restraighteners:				
Plants	.....	1	3	5
Employees	.....	4	4	9
Average earnings per hour...cents..	.....	35.3	42.6	40.0
Roll engineers:				
Plants	2	2	4	9
Employees	8	12	24	48
Average earnings per hour...cents..	24.6	26.0	36.6	31.6
Rollers:				
Plants	.....	2	4	7
Employees	.....	6	10	18
Average earnings per hour...cents..	.....	59.7	61.4	60.6

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AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY PRINCIPAL DISTRICTS—STANDARD RAIL MILLS—Concluded.

Occupations.	Eastern district.	Pittsburgh district.	Great Lakes and Middle West district.	Total, all districts.
Rollers' helpers:				
Plants	.....	1	1	3
Employees	.....	4	3	10
Average earnings per hour.....cents	.....	48.5	56.1	48.7
Saw men, cold:				
Plants	2	2	5	9
Employees	5	13	14	32
Average earnings per hour.....cents	19.7	20.6	19.4	20.0
Saw men helpers, cold:				
Plants	2	2	3	7
Employees	20	16	22	58
Average earnings per hour.....cents	16.0	20.4	16.3	17.6
Saw men, hot:				
Plants	1	2	5	9
Employees	2	6	17	26
Average earnings per hour.....cents	20.6	25.2	29.3	27.4
Saw men's helpers, hot:				
Plants	2	2	5	10
Employees	34	16	56	109
Average earnings per hour.....cents	17.3	17.6	16.3	16.8
Stampers:				
Plants	1	2	4	8
Employees	3	8	15	27
Average earnings per hour.....cents	19.0	19.1	17.1	17.3
Straighteners, gag press:				
Plants	2	2	5	10
Employees	33	64	100	210
Average earnings per hour.....cents	61.6	40.3	56.0	51.4
Straighteners' helpers (gaggers):				
Plants	2	2	4	9
Employees	26	51	81	172
Average earnings per hour.....cents	31.4	19.8	20.4	21.3
Straighteners' helpers, other:				
Plants	1	1	3	6
Employees	44	29	65	155
Average earnings per hour.....cents	23.2	16.6	19.8	19.6
Table lever men:				
Plants	2	2	5	10
Employees	18	22	68	113
Average earnings per hour.....cents	29.6	31.4	43.4	33.7
Table men:				
Plants	2	2	3	8
Employees	23	14	18	59
Average earnings per hour.....cents	28.4	30.7	24.0	27.3
Unclassified:				
Plants	2	2	5	10
Employees	29	45	127	209
Average earnings per hour.....cents	18.7	19.1	21.5	20.7

Of the employees 51.06 per cent were in the Great Lakes and Middle West district and only two plants are reported from the Eastern and from the Pittsburgh districts. One other district is represented by one plant; this district, however, is not here shown, but is included in the total for all districts. The number of employees in practically all the occupations is too small for purposes of comparison. Laborers in both the Pittsburgh and the Great Lakes and Middle West districts averaged 16.4 cents per hour; in the Eastern district the average is only 13.8 cents per hour.

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The next table compares the earnings of time workers and tonnage workers. In practically every occupation the tonnage workers earned more than the time workers.

COMPARISON OF AVERAGE EARNINGS PER HOUR OF TIME WORKERS AND OF TONNAGE WORKERS, BY OCCUPATIONS—STANDARD RAIL MILLS.

Occupations.	Time.			Tonnage.			Time and tonnage combined.		
	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.
Charging-machine operators.	1	1	$0.154	4	31	$0.230	5	32	$0.229
Chippers	3	23	.169	9	200	.236	9	223	.228
Conveyor men	6	30	.162	1	4	.183	7	34	.164
Cranemen	8	40	.232	4	33	.372	10	73	.286
Door operators	6	45	.112	.....	.....	.....	6	45	.112
Drillers and punchers	4	34	.179	9	259	.227	10	293	.220
Engineers, stationary	5	20	.188	2	26	.212	6	46	.201
Greasers	9	83	.176	2	10	.183	9	93	.178
Guide setters	3	7	.331	5	29	.435	8	36	.408
Heaters	3	9	.408	6	44	.538	9	53	.516
Heaters' helpers	5	31	.230	3	30	.283	8	61	.256
Hotbed lever men	6	39	.189	4	21	.212	10	60	.197
Hotbed men	7	44	.164	5	33	.179	10	77	.170
Inspectors	8	135	.225	4	15	.228	9	150	.225
Laborers	10	1,053	.158	.....	.....	.....	10	1,053	.158
Restraighteners	1	2	.271	4	7	.444	5	9	.400
Roll engineers	5	26	.253	4	22	.400	9	48	.316
Rollers	4	10	.607	4	8	.603	7	18	.606
Rollers' helpers	.....	.....	.....	3	10	.487	3	10	.487
Saw men, cold	5	23	.186	4	9	.238	9	32	.200
Saw men's helpers, cold	5	39	.160	2	19	.234	7	58	.176
Saw men, hot	2	5	.243	7	21	.281	9	26	.274
Saw men's helpers, hot	7	75	.165	3	34	.175	10	109	.168
Stampers	7	23	.171	2	4	.216	8	27	.173
Straighteners, gag press	.....	.....	.....	10	210	.514	10	210	.514
Straighteners' helpers (gaggers)	2	27	.166	8	145	.223	9	172	.213
Straighteners' helpers, others	3	65	.162	3	90	.222	6	155	.196
Table lever men	2	14	.299	8	99	.403	10	113	.387
Table men	3	12	.206	6	47	.294	8	59	.273
Unclassified	10	113	.192	6	96	.229	10	209	.207

The table which follows shows for each principal occupation the number of plants reporting, normal number of employees, average earnings per hour, and per cent of employees earning each classified amount per hour. The occupations are in order following the process of manufacture.

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PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS—STANDARD RAIL MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Heaters	9	53	$0.516	.....	.....	.....	.....	.....	.....	1.89	15.09	60.38	.....	.....	22.64
Heaters' helpers	8	61	.256	.....	.....	.....	1.64	18.03	24.59	26.23	29.51	.....	.....	.....	.....
Roll engineers	9	48	.316	.....	.....	.....	.....	8.33	20.83	25.00	25.00	20.83	.....	.....	.....
Rolling crew:															
Rollers	7	18	.606	.....	.....	.....	.....	.....	.....	.....	.....	11.11	22.22	66.67	.....
Rollers' helpers	3	10	.487	.....	.....	.....	.....	.....	.....	.....	30.00	20.00	50.00	.....	.....
Table lever men	10	113	.387	.....	.....	.....	.....	.....	20.35	7.08	37.17	19.47	.....	10.62	5.31
Table men	8	59	.273	.....	.....	.....	3.39	10.17	10.17	30.51	45.76	.....	.....	.....	.....
Guide setters	3	36	.408	.....	.....	.....	.....	.....	11.11	13.89	30.56	19.44	25.00	.....	.....
Saw men, hot	9	26	.274	.....	.....	.....	.....	.....	46.15	15.38	38.46	.....	.....	.....	.....
Saw men's helpers, hot	10	109	.168	.....	.....	25.69	55.05	19.27	.....	.....	.....	.....	.....	.....	.....
Hotbed lever men	10	60	.197	8.33	3.33	13.33	6.67	23.33	30.00	15.00	.....	.....	.....	.....	.....
Hotbed men	10	77	.170	7.79	.....	27.27	33.77	12.99	18.18	.....	.....	.....	.....	.....	.....
Chippers	9	223	.228	.....	.....	3.14	8.97	19.73	26.91	26.46	14.80	.....	.....	.....	.....
Straighteners, gag press	10	210	.514	.....	.....	.....	.....	.....	.95	2.38	7.14	30.48	29.52	26.67	2.86
Straighteners' helpers (gaggers)	9	172	.213	.....	.....	1.74	26.16	.....	52.33	5.23	4.07	10.47	.....	.....	.....
Drillers and punchers	10	293	.220	.....	.....	.....	10.92	4.78	57.34	17.75	.....	9.22	.....	.....	.....
Saw men, cold	9	32	.200	.....	.....	.....	15.63	56.25	15.63	12.50	.....	.....	.....	.....	.....
Saw men's helpers, cold	7	58	.176	.....	15.52	12.07	39.66	.....	32.76	.....	.....	.....	.....	.....	.....
Cranemen	10	73	.286	.....	.....	.....	2.74	12.33	27.40	16.44	24.66	.....	16.41	.....	.....
Inspectors	9	150	.225	.....	.....	.67	11.33	25.33	50.00	8.67	3.33	.67	.....	.....	.....
Laborers	10	1,053	.158	.09	14.34	36.37	49.19	.....	.....	.....	.....	.....	.....	.....	.....
Other occupations	.....	650	.193	6.77	3.69	8.62	31.85	14.15	23.69	4.62	4.46	.62	.46	1.08	.....
Total, all occupations	10	3,584	.228	1.56	5.19	14.34	26.84	7.84	19.39	7.17	6.64	5.27	2.65	2.43	.67

Rollers are the highest paid employees. The average earnings for the 18 employees reported were 60.6 cents per hour; 12 of them earned 60 and under 70 cents per hour; 4 earned 50 and under 60 cents per hour; and 2 earned 40 and under 50 cents per hour.

Heaters are also high-paid employees and average 51.6 cents per hour. The lowest earnings reported for heaters were 25 and under 30 cents per hour and the highest 90 cents and under $1 per hour.

The lowest paid employees are laborers, and the 1,053 in this occupation averaged only 15.8 cents per hour; 49.19 per cent earned 16 and under 18 cents per hour, 36.37 per cent earned 14 and under 16 cents per hour, and 14.34 per cent earned 12 and under 14 cents per hour.

The next table shows for each of the districts the number of plants reporting, normal number of employees, average earnings per hour, and number of employees earning each classified amount per hour. Time workers and tonnage workers are shown separately, and the two classes are also combined.

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NUMBER OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS BY PRINCIPAL DISTRICTS—STANDARD RAIL MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Number of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
TIME WORKERS.															
Eastern	2	396	$0.141	12	135	205	15	14	15	.....	.....	.....	.....	.....	.....
Pittsburgh	2	295	.175	8	10	52	176	16	22	8	1	.....	.....	2	.....
Great Lakes and Middle West	5	1,189	.185	36	.....	124	664	144	133	38	35	9	.....	6	.....
Total, all districts	10	2,028	.177	56	169	476	857	176	186	53	38	9	.....	8	.....
TONNAGE WORKERS.															
Eastern	2	353	.262	.....	.....	21	12	19	137	25	56	50	13	20	.....
Pittsburgh	2	421	.268	.....	15	4	80	20	82	74	73	64	7	2	.....
Great Lakes and Middle West	5	641	.339	.....	.....	2	9	34	230	96	64	65	60	57	24
Total, all districts	10	1,556	.298	.....	17	38	105	105	509	204	200	180	95	79	24
TIME AND TONNAGE WORKERS.															
Eastern	2	749	.205	12	135	226	27	33	152	25	56	50	13	20	.....
Pittsburgh	2	716	.228	8	25	56	256	36	104	82	74	64	7	4	.....
Great Lakes and Middle West	5	1,830	.235	36	.....	126	673	178	363	134	99	74	60	63	24
Total, all districts	10	3,584	.228	56	186	514	962	281	695	257	238	189	95	87	24

The table which follows shows, by principal districts, the per cent of employees earning each classified amount per hour. Time workers and tonnage workers are combined in this table.

PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS BY PRINCIPAL DISTRICTS—STANDARD RAIL MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				10 and under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Eastern	2	749	$0.205	1.60	18.02	30.17	3.60	4.41	20.29	3.34	7.48	6.68	1.74	2.67	.....
Pittsburgh	2	716	.228	1.12	3.49	7.82	35.75	5.03	14.53	11.45	10.34	8.94	.98	.56	.....
Great Lakes and Middle West	5	1,830	.235	1.97	.....	6.89	36.78	9.73	19.84	7.32	5.41	4.04	3.28	3.44	1.31
Total, all districts	10	3,584	.228	1.56	5.19	14.34	26.84	7.84	19.39	7.17	6.64	5.27	2.65	2.43	.67

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The average hourly earnings for the 3,584 employees was 22.8 cents. Comparing the three principal districts, the average earnings were lowest in the Eastern district and highest in the Great Lakes and Middle West district.

In the Eastern district 30.17 per cent earned 14 and under 16 cents per hour, in the Pittsburgh district 35.75 per cent earned 16 and under 18 cents per hour, and in the Great Lakes and Middle West district 36.78 per cent earned 16 and under 18 cents per hour. The lowest classified earnings were 10 and under 12 cents per hour, reported in each of the three principal districts, the highest were 98 cents and under $1, reported in one district. More than one-fourth, 26.84 per cent of the employees in all districts, earned 16 and under 18 cents per hour, 19.39 per cent earned 20 and under 25 cents per hour, and 14.34 per cent earned 14 and under 16 cents per hour.

The summary in the form of cumulative percentages which follows shows the proportion of total employees within certain earning limits.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR—STANDARD RAIL MILLS.

Earnings per hour.	Normal number of employees.	Per cent of total number of employees.	Earnings per hour.	Normal number of employees.	Per cent of total number of employees.
Under 14 cents	242	6.75	Under 25 cents	2,694	75.16
Under 16 cents	756	21.09	Under 30 cents	2,951	82.33
Under 18 cents	1,718	47.93	Under 40 cents	3,189	88.97
Under 20 cents	1,999	55.77	Under 50 cents	3,378	94.24

A comparison of earnings in the principal districts by means of cumulative percentages is presented in the table which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY PRINCIPAL DISTRICTS—STANDARD RAIL MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning per hour—							
			Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
Eastern	749	$0.205	19.62	49.79	53.39	57.80	78.09	81.43	88.91	95.59
Pittsburgh	716	.228	4.61	12.43	48.18	53.21	67.74	79.19	89.53	98.47
Great Lakes and Middle West	1,830	.235	1.97	8.86	45.64	55.37	75.21	82.53	87.94	91.98
Total, all districts	3,584	.228	6.75	21.09	47.93	55.77	75.16	82.33	88.97	94.24

From the above summary it is seen that 6.75 per cent of all employees earned less than 14 cents per hour, 21.09 per cent earned less than 16 cents per hour, and 47.93 per cent earned less than 18 cents per hour. Only 5.76 per cent earned as much as 50 cents per hour.

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CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working hours per week for each occupation and in each plant are presented in detail in Table I, Volume II of this report. These data are summarized in the tables which follow. The first of these tables shows for each occupation the number of plants reporting, the normal number of employees, the average customary working hours per week, and the number of employees whose customary working time was each classified number of hours per week.

NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH CLASSIFIED NUMBER OF HOURS PER DAY AND AVERAGE HOURS WORKED PER WEEK—STANDARD RAIL MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Charging-machine operators	5	32	73.5	.....	.....	.....	.....	.....	24	8	.....	.....
Chippers	9	223	71.5	.....	.....	.....	12	41	141	.....	29	.....
Conveyor men	7	34	77.9	.....	.....	.....	.....	1	16	.....	17	.....
Cranemen	10	73	70.9	12	.....	.....	1	7	31	.....	22	.....
Door operators	6	45	72.0	.....	.....	.....	.....	.....	45	.....	.....	.....
Drillers and punchers	10	293	73.9	.....	.....	.....	20	27	166	.....	80	.....
Engineers, stationary	6	46	75.1	.....	.....	.....	.....	.....	34	.....	12	.....
Greasers	9	93	74.1	.....	.....	.....	.....	3	72	.....	18	.....
Guide setters	8	36	68.8	3	.....	.....	1	5	27	.....	.....	.....
Heaters	9	53	67.6	12	.....	.....	.....	.....	35	2	4	.....
Heaters' helpers	8	61	70.5	6	.....	.....	.....	12	37	.....	6	.....
Hotbed lever men	10	60	72.7	.....	.....	.....	.....	3	51	.....	6	.....
Hotbed men	10	77	72.8	.....	.....	.....	.....	2	69	.....	6	.....
Inspectors	9	150	72.3	.....	.....	.....	9	32	78	2	29	.....
Laborers	10	1,053	72.8	.....	.....	.....	52	237	514	.....	250	.....
Restraighteners	5	9	73.3	.....	.....	.....	.....	.....	8	.....	1	.....
Roll engineers	9	48	76.0	.....	.....	.....	.....	4	26	.....	18	.....
Rollers	7	18	72.0	.....	.....	.....	.....	.....	18	.....	.....	.....
Rollers' helpers	3	10	72.0	.....	.....	.....	.....	.....	10	.....	.....	.....
Saw men, cold	9	32	74.6	.....	.....	.....	6	2	10	.....	14	.....
Saw men helpers, cold	7	58	75.1	.....	.....	.....	.....	11	26	.....	21	.....
Saw men, hot	9	26	72.0	.....	.....	.....	.....	.....	26	.....	.....	.....
Saw men helpers, hot	10	109	71.4	.....	.....	.....	.....	15	92	.....	2	.....
Stampers	8	27	71.3	.....	.....	.....	.....	3	24	.....	.....	.....
Straighteners, gag press	10	210	61.0	98	.....	3	6	2	77	.....	24	.....
Straighteners' helpers (gaggers)	9	172	70.2	18	.....	.....	6	2	120	.....	26	.....
Straighteners' helpers, other	6	155	71.1	.....	.....	.....	17	2	130	.....	6	.....
Table lever men	10	113	67.6	24	.....	.....	.....	14	61	.....	14	.....
Table men	8	59	71.4	.....	.....	.....	.....	5	54	.....	.....	.....
Unclassified	10	209	68.0	9	.....	12	40	29	100	.....	19	.....
Total, all occupations	10	3,584	72.5	182	.....	15	170	459	2,122	12	624	.....

Practically all of the employees working 48 hours and less are those in the high-paid occupations. The table which follows shows for each of the principal occupations, in the order of processes of manufacture, the per cent of employees customarily working each classified number of hours per week.

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PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK—STANDARD RAIL MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Heaters	9	53	67.6	22.64	.....	.....	.....	.....	66.04	3.77	7.55	.....
Heaters' helpers	8	61	70.5	9.84	.....	.....	.....	19.67	60.66	.....	9.84	.....
Roll engineers	9	48	76.0	.....	.....	.....	.....	8.33	54.17	.....	37.50	.....
Rolling crew:												
Rollers	7	18	72.0	.....	.....	.....	.....	.....	100.00	.....	.....	.....
Rollers' helpers	3	10	72.0	.....	.....	.....	.....	.....	100.00	.....	.....	.....
Table lever men	10	113	67.6	21.24	.....	.....	.....	12.39	53.98	.....	12.39	.....
Table men	8	59	71.4	.....	.....	.....	.....	8.47	91.53	.....	.....	.....
Guide setters	8	36	68.8	8.33	.....	.....	2.78	13.89	75.00	.....	.....	.....
Saw men, hot	9	26	72.0	.....	.....	.....	.....	.....	100.00	.....	.....	.....
Saw men helpers, hot	10	109	71.4	.....	.....	.....	.....	13.76	84.40	.....	1.83	.....
Hotbed lever men	10	60	72.7	.....	.....	.....	.....	5.00	85.00	.....	10.00	.....
Hotbed men	10	77	72.8	.....	.....	.....	.....	2.60	89.61	.....	7.79	.....
Chippers	9	223	71.5	.....	.....	.....	5.38	18.39	63.23	.....	13.00	.....
Straighteners, gag press	10	210	61.0	46.67	.....	1.43	2.86	.95	36.67	.....	11.43	.....
Straighteners, helpers (gaggers)	9	172	70.2	10.47	.....	.....	3.49	1.16	69.77	.....	15.12	.....
Drillers and punchers	10	293	73.9	.....	.....	.....	6.83	9.22	56.66	.....	27.30	.....
Saw men, cold	9	32	74.6	.....	.....	.....	18.75	6.25	31.25	.....	43.75	.....
Saw men's helpers, cold	7	58	75.1	.....	.....	.....	.....	18.97	44.83	.....	36.21	.....
Cranemen	10	73	70.9	16.44	.....	.....	1.37	9.59	42.47	.....	30.14	.....
Inspectors	9	150	72.3	.....	.....	.....	6.00	21.33	52.00	1.33	19.33	.....
Laborers	10	1,053	72.8	.....	.....	.....	4.94	22.51	48.81	.....	23.74	.....
Other occupations	.....	650	71.4	1.38	.....	1.85	8.77	5.85	69.69	1.23	11.23	.....
Total, all occupations	10	3,584	72.5	5.08	.....	.42	4.74	12.81	59.21	.33	17.41	.....

Of the 1,053 laborers, 23.74 per cent worked 84 hours. Even higher percentages than that are shown in some of the other occupations, in which, however, there were fewer employees.

The table which follows shows for each of the principal occupations the per cent of employees whose customary working time was 72 hours and over per week and also the per cent whose customary working time was 84 hours per week. There were none reported as working over 84 hours. In all but two occupations 70 per cent or more of the employees worked at least 72 hours per week.

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PER CENT OF EMPLOYEES IN THE PRINCIPAL OCCUPATIONS CUSTOMARILY WORKING 72 HOURS AND OVER PER WEEK—STANDARD RAIL MILLS.

Occupations.	Normal number of employees.	Per cent of employees whose customary working hours per week were—	
		72 and over.	84.
Heaters	53	77.36	7.55
Heaters' helpers	61	70.50	9.84
Roll engineers	48	91.67	37.50
Rolling crew:			
Rollers	18	100.00	.....
Rollers' helpers	10	100.00	.....
Table lever man	113	66.37	12.39
Table men	59	91.53	.....
Guide setters	36	75.00	.....
Saw men, hot	26	100.00	.....
Saw men's helpers, hot	109	86.23	1.83
Hotbed lever men	60	95.00	10.00
Hotbed men	77	97.40	7.79
Chippers	223	76.23	13.00
Straighteners, gag press	210	48.10	11.43
Straighteners' helpers (gaggers)	172	84.89	15.12
Drillers and punchers	293	83.96	27.30
Saw men, cold	32	75.00	43.75
Saw men's helpers, cold	58	81.04	36.21
Cranemen	73	72.61	30.14
Inspectors	150	72.66	19.33
Laborers	1,053	72.55	23.74
Total, all occupations	3,584	76.95	17.41

The next table is the summary showing the number of employees working each classified number of hours per week in the principal districts. Time workers and tonnage workers are shown separately.

NUMBER OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK. BY PRINCIPAL DISTRICTS—STANDARD RAIL MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under. 56.	56 and under 60.	60.	Over 60 and under. 72.	72.	Over 72 and under. 84.	84.	Over 84.
TIME WORKERS.												
Eastern	2	396	67.9	.....	.....	.....	.....	265	121	2	8	.....
Pittsburgh	2	295	75.3	.....	.....	.....	8	3	193	.....	91	.....
Great Lakes and Middle West	5	1,189	74.2	9	.....	.....	76	51	713	.....	340	.....
Total, all districts.	10	2,028	73.0	9	.....	.....	87	319	1,172	2	439	.....
TONNAGE WORKERS.												
Eastern	2	353	66.6	38	.....	.....	.....	116	199	.....	.....	.....
Pittsburgh	2	421	69.9	42	.....	15	.....	24	300	10	30	.....
Great Lakes and Middle West	5	641	75.9	93	.....	.....	83	.....	310	.....	155	.....
Total, all districts.	10	1,556	71.8	173	.....	15	83	140	950	10	185	.....
TIME AND TONNAGE WORKERS.												
Eastern	2	749	67.3	38	.....	.....	.....	381	320	2	8	.....
Pittsburgh	2	716	72.1	42	.....	15	8	27	493	10	121	.....
Great Lakes and Middle West	5	1,830	74.8	102	.....	.....	159	51	1,023	.....	495	.....
Total, all districts.	10	3,584	72.5	182	.....	15	170	459	2,122	12	624	.....

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The average customary working time for the 2,028 time-work employees was 73 hours, and for the 1,556 tonnage-work employees 71.8 hours. In the Great Lakes and Middle West district the average hours for the tonnage workers was greater than the average for the time workers. In the other districts, the tonnage workers averaged fewer hours per week than did the time workers.

The table which follows shows for time workers and tonnage workers combined the per cent of employees in three districts customarily working each classified number of hours per week. The total for all districts is placed in comparison.

PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK, BY PRINCIPAL DISTRICTS—STANDARD RAIL MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Eastern	2	749	67.3	5.07	.....	.....	.....	50.87	42.72	0.27	1.07	.....
Pittsburgh	2	716	72.1	5.87	.....	2.09	1.12	3.77	68.85	1.40	16.90	.....
Great Lakes and Middle West	5	1,830	74.8	5.57	.....	.....	8.69	2.79	55.90	.....	27.05	.....
Total, all districts.	10	3,584	72.5	5.08	.....	.42	4.74	12.81	59.21	.83	17.41	.....

A considerably larger proportion of employees in the Great Lakes and Middle West district than in any other district worked 84 hours per week; in that district 27.05 per cent of all employees worked 84 hours per week; in the Pittsburgh district, 16.90 per cent; and in the Eastern district, 1.07 per cent.

The average customary working time per week for 3,584 employees in the special iron and steel occupations in the standard-rail mills was 72.5 hours.

Eighty-four hours per week was the customary working time for 17.41 per cent of all employees, and only 10.24 per cent worked 60 hours and less. Of all employees, 59.54 per cent worked 72 and under 84 hours.

DAYS WORKED PER WEEK.

Under each occupation the customary working days or turns per week for each plant are shown in Table I, Volume II of this report. These data are briefly summarized here. The table which follows shows for each occupation the number of plants reporting, the normal

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number of employees, and the number of employees whose customary working time was each specified number of day or turns per week:

NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK—STANDARD RAIL MILLS.

Occupations.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Charging-machine operators	5	32	.....	.....	32	.....	.....
Chippers	9	223	.....	25	169	.....	29
Conveyor men	7	34	.....	.....	16	.....	18
Cranemen	10	73	.....	7	44	.....	22
Door operators	6	45	.....	.....	45	.....	.....
Drillers and punchers	10	293	.....	27	186	.....	80
Engineers, stationary	6	46	.....	.....	34	.....	12
Greasers	9	93	.....	3	72	.....	18
Guide setters	8	36	.....	5	31	.....	.....
Heaters	9	53	.....	.....	49	.....	4
Heaters' helpers	8	61	.....	.....	55	.....	6
Hotbed lever men	10	60	.....	3	51	.....	6
Hotbed men	10	77	.....	2	69	.....	6
Inspectors	9	150	.....	32	89	.....	29
Laborers	10	1,053	.....	189	612	.....	252
Restraighteners	5	9	.....	.....	8	.....	1
Roll engineers	9	48	.....	4	26	.....	18
Rollers	7	18	.....	.....	18	.....	.....
Rollers' helpers	3	10	.....	.....	10	.....	.....
Saw men, cold	9	32	.....	2	16	.....	14
Saw men's helpers, cold	7	58	.....	11	26	.....	21
Saw men, hot	9	26	.....	.....	26	.....	.....
Saw men's helpers, hot	10	109	.....	9	98	.....	2
Stampers	8	27	.....	3	24	.....	.....
Straighteners, gag press	10	210	.....	20	161	.....	29
Straighteners' helpers (gaggers)	9	172	.....	18	126	4	24
Straighteners' helpers, other	6	155	.....	.....	147	.....	8
Table lever men	10	113	.....	14	93	.....	6
Table men	8	59	.....	5	54	.....	.....
Unclassified	10	209	.....	11	165	.....	33
Total, all occupations	10	3,584	.....	390	2,552	4	638

The customary working time per week was 6 days or turns for 2,552 employees, or 71.21 per cent of the total, in the special iron and steel occupations in the standard rail mills. The customary working time per week was 7 days or turns for 638 employees, or 17.80 per cent of the total, and 5 and 6 days or turns alternately for 390 employees, or 10.88 per cent of the total.

The table which follows shows the per cent of employees in each of the principal occupations in standard rail mills working each specified number of days or turns per week:

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PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK—STANDARD RAIL MILLS.

Occupations.	Number of plants.	Normal number of employees.	Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Heaters	9	53	.....	.....	92.45	.....	7.55
Heaters' helpers	8	61	.....	.....	90.16	.....	9.84
Roll engineers	9	48	.....	8.33	54.17	.....	37.50
Rolling crew:							
Rollers	7	18	.....	.....	100.00	.....	.....
Rollers' helpers	8	10	.....	.....	100.00	.....	.....
Table lever men	10	113	.....	12.39	82.30	.....	5.31
Table men	8	59	.....	8.47	91.53	.....	.....
Guide setters	8	36	.....	13.89	86.11	.....	.....
Saw men, hot	9	26	.....	.....	100.00	.....	.....
Saw men's helpers, hot	10	109	.....	8.26	89.91	.....	1.83
Hotbed lever men	10	60	.....	5.00	85.00	.....	10.00
Hotbed men	10	77	.....	2.60	89.61	.....	7.79
Clippers	9	223	.....	11.21	75.78	.....	13.00
Straighteners, gag press	10	210	.....	9.52	76.67	.....	13.81
Straighteners' helpers (gaggers)	9	172	.....	10.47	73.26	2.33	13.95
Drillers and punchers	10	293	.....	9.22	63.48	.....	27.30
Saw men, cold	9	32	.....	6.25	50.00	.....	43.75
Saw men's helpers, cold	7	58	.....	18.97	44.83	.....	36.21
Cranemen	10	73	.....	9.59	60.27	.....	30.14
Inspectors	9	150	.....	21.33	59.33	.....	19.33
Laborers	10	1,053	.....	17.95	58.12	.....	23.93
Other occupations	.....	650	.....	2.62	83.54	.....	13.85
Total, all occupations	10	3,584	.....	10.88	71.21	.11	17.80

More than one-fifth of all employees in each of the following occupations worked 7 days or turns per week:

	Per cent.
Saw men, cold	43.75
Roll engineers	37.50
Saw men's helpers, cold	36.21
Cranemen	30.14
Drillers and punchers	27.30
Laborers	23.93

The table which follows shows for three principal disticts and for all districts the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY PRINCIPAL DISTRICTS—STANDARD RAIL MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Eastern	2	749	.....	390	351	.....	8	.....	52.07	46.86	.....	1.07
Pittsburgh	2	716	.....	.....	580	4	132	.....	.....	81.01	0.56	18.44
Great Lakes and Middle West	5	1,830	.....	.....	1,332	.....	498	.....	.....	72.79	.....	27.21
Total, all districts	10	3,584	.....	390	2,552	4	638	.....	10.88	71.21	.11	17.80

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STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

INTRODUCTION.

The data relative to earnings and hours of work are summarized briefly in the pages immediately following and analyzed in more detail on pages 229 to 242.

SUMMARY OF EARNINGS AND HOURS AND DAYS OF WORK.

EARNINGS.

Data relative to earnings in structural, light rail, and other shape mills were reported for 3,160 employees in special iron and steel occupations in 16 plants. The average earnings per hour for the 3,160 employees were 21.6 cents. Of the total number of employees 52.03 per cent were in the Pittsburgh district, although considerable numbers were in the Great Lakes and Middle West district and in the Eastern district. One plant, with 41 employees, is not reported separately, although it is included in the total. The average earnings were lowest in the Great Lakes and Middle West district and highest in the Pittsburgh district.

Of the 3,160 employees included in this report in structural, light rail, and other shape mills, 32.22 per cent earned 16 and under 18 cents per hour, 15.85 per cent earned 14 and under 16 cents per hour, and 13.16 per cent earned 18 and under 20 cents per hour. The per cent of employees in all districts and in each of three districts earning each classified amount per hour is shown in the table which follows:

PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY PRINCIPAL DISTRICTS—STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.							
			Under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 cts. and over.
Eastern	477	$0.216	36.69	14.26	11.53	18.03	5.45	9.85	1.05	3.15
Pittsburgh	1,644	.232	8.76	33.33	14.36	11.07	13.93	12.83	3.10	2.61
Great Lakes and Middle West	998	.192	23.65	39.98	12.53	12.12	6.91	2.51	.70	1.60
Total, all districts	3,160	.216	18.39	32.22	13.16	12.41	10.41	9.02	1.99	2.40

The summary, in the form of cumulative percentages, which follows shows that under one-fifth of all employees, 18.39 per cent, earned less than 16 cents per hour; one-half, 50.61 per cent, earned less than 18 cents per hour; and over three-fourths, 76.18 per cent, earned less than 25 cents per hour.

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PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY PRINCIPAL DISTRICTS—STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning per hour—						
			Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
Eastern	477	$0.216	36.69	50.95	62.48	80.51	85.96	95.81	96.86
Pittsburgh	1,644	.232	8.76	42.09	56.45	67.52	81.45	94.28	97.38
Great Lakes and Middle West	998	.192	23.65	63.63	76.16	88.28	95.19	97.70	98.40
Total, all districts	3,160	.216	18.39	50.61	63.77	76.18	86.59	95.61	97.60

A comparison of the three principal districts for which the details are reported separately shows that the earnings were under 16 cents for 36.69 per cent of the 477 employees in the Eastern district, 23.65 per cent of the 998 employees in the Great Lakes and Middle West district, and 8.76 per cent of the 1,644 employees in the Pittsburgh district. The earnings were under 20 cents per hour for 76.16 per cent of the employees in the Great Lakes and Middle West district, 62.48 per cent of the employees in the Eastern district, and 56.45 per cent of the employees in the Pittsburgh district.

HOURS OF LABOR.

The customary working hours for a full week were reported for 3,160 employees in special iron and steel occupations in 16 plants having mills of this character. The average hours per week were 70. Of all employees, 48.83 per cent worked 72 hours per week, and almost two-thirds, 66.36 per cent, worked 72 hours and over per week. The customary working hours were 84 per week for 15.57 per cent of the total.

The per cent of employees working each classified number of hours per week for each of the three principal districts and for the combined districts are shown in the following summary:

PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY PRINCIPAL DISTRICTS—STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts"]

Districts.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—			
			Under 60.	60 and under 72.	72.	Over 72.
Eastern	477	62.4	42.77	53.04	3.35	0.84
Pittsburgh	1,644	70.6	9.24	11.49	64.90	14.35
Great Lakes and Middle West	998	73.1	.....	22.44	46.09	31.46
Total, all districts	3,160	70.0	11.27	22.38	48.83	17.53

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In only three districts, the Eastern, Pittsburgh, and Great Lakes and Middle West, are any considerable number of employees represented. The average hours in the Eastern district are much less than in either of the other two principal districts.

The customary working time per week was less than 60 hours for 42.77 per cent of all employees in the Eastern district and for 9.24 per cent of all employees in the Pittsburgh district. None of the employees in the Great Lakes and Middle West district worked less than 60 hours per week. The customary working time was 72 hours and over for 79.25 per cent of all employees in the Pittsburgh district, for 77.55 per cent of all employees in the Great Lakes and Middle West district, and for 4.19 per cent of all employees in the Eastern district. The customary working time per week was 84 hours for 31.46 per cent of all employees in the Great Lakes and Middle West district, and for 10.64 per cent of all employees in the Pittsburgh district, and for less than 1 per cent of the employees in the Eastern district.

DAYS PER WEEK.

Six days or turns per week was the customary working time for 1,966 employees, or 62.22 per cent of the 3,160 employees in the special occupations in the 16 structural, light rail, and other shape mills. Five and six turns per week, alternating, was the customary working time for 632 employees, or 20 per cent of the total, and 7 days or turns per week was the customary working time for 499 employees, or 15.79 per cent of the total.

The percentage of employees whose customary working time per week was 7 days or turns is shown by districts in the table which follows:

PER CENT OF EMPLOYEES WHOSE CUSTOMARY WORKING HOURS PER WEEK WERE 7 DAYS, BY DISTRICTS—STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

Districts.	Normal number of employees.	Per cent of employees whose customary working time per week was 7 days.
Eastern	477	0.63
Pittsburgh	1,644	11.01
Great Lake and Middle West	998	31.56
Southern	41	.....
Total, all districts	3,160	15.79

DESCRIPTION OF OCCUPATIONS.

In the following description of occupations the occupation name represents the term retained in the report and under which data as to wages and hours of labor are presented. The names shown in

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parenthesis represent the most important minor occupations included under the name used in this report as well as other terms used in various establishments to indicate the same class of work. In the first paragraph, "Duties," is given a description of the functions which employees in the occupation perform and the method by which the work is done. In the second paragraph, "Nature of work," two points are covered—first, an indication of the type of workman required for the position, and, second, the conditions under which the work is done.

STOCKERS.

DUTIES.—Get the proper billets and blooms from the yard stock piles and deliver them either to the crane or to the furnace.

NATURE OF WORK.—Heavy, and requires unskilled laborers of a high grade.

HEATERS; HEATERS' HELPERS; CHARGING-MACHINE OPERATORS; CHARGERS; DOOR OPERATORS.

Horizontal reheating furnaces only are used for heating blooms and billets. See same occupations, pages 154 and 206 and 261 to 263.

ROLL ENGINEERS.

Practically none of the engines are reversing. See roll engineers, page 157.

ROLLERS.

See rollers, page 206.

ROUGHERS.

DUTIES.—Have charge of the roughing or first set of rolls. Set guides (see guide setters, page 207) and frequently handle levers controlling the table for this set of rolls.

NATURE OF WORK.—Responsible position, demanding highly skilled workmen of considerable experience. Much of the work is heavy, requiring some exposure to heat.

FINISHERS.

DUTIES.—In charge of the last or finishing set of rolls. Set guides and frequently operate tables for this set of rolls.

NATURE OF WORK.—Responsible position, and generally requiring more skill than that of rougher.

TABLE LEVER MEN.

DUTIES.—Handle levers controlling tables not operated by roughers or finishers. See table lever men, page 207, and manipulators, page 158.

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NATURE OF WORK.—Varying degree of skill and responsibility, depending upon whether a tilting or lifting table is used or whether it is simply a stationary table in which the rollers have to be reversed to send the piece into the next pass.

TABLE MEN.

(Including Hookers, Hook Men.)

DUTIES.—Handle steel at rolls and see that it enters passes properly. See table men, page 159.

ROLL HANDS.

DUTIES.—Include a miscellaneous set of occupations required in rolling by local conditions or in which there was such a combination of duties that the work could not be included in any of the occupations reported above.

NATURE OF WORK.—Amount of skill and experience required as well as the general conditions under which the work is done vary to such an extent that it is impossible to specify definitely.

SAW MEN, HOT.

See saw men, hot, page 208.

SHEARMEN.

DUTIES.—Many of the simpler "shapes," such as angles, can be sheared, and this is done wherever possible on account of the greater economy. The shear is small when compared with the massive shears used in blooming mills and is actuated by a single lever, the shearman frequently operating the gauge.

NATURE OF WORK.—Requires little training or experience. The work is not heavy, but requires constant attention.

SAW MEN, COLD.

DUTIES.—Much of the material is sawed to fill small special orders, and this sawing is usually done when the material is cold.

NATURE OF WORK.—The work is comparatively light, but as it varies in character requires constant attention.

SHEARMEN'S AND SAW MEN'S HELPERS.

DUTIES.—Assist in handling material and cleaning up scrap.

NATURE OF WORK.—Light, and requires only unskilled workmen.

STRAIGHTENERS.

DUTIES.—A part of the material is straightened in a "gag press" similar to that in use in standard rail mills (see straighteners, gag press, p. 209), but much less massive. A considerable part, however,

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is straightened on the "roller press," the general principle of which is the same as the straightening device described for plate mills. See straighteners, page 187.

NATURE OF WORK.—The same man usually uses both methods, depending on the character of product made. The work on the "roller press" is lighter, but requires almost if not quite as much skill and experience as that on the "gag press."

STRAIGHTENERS' HELPERS.

DUTIES.—Act as gaggers (see straighteners' helpers (gaggers), p. 209) and assist in handling product.

NATURE OF WORK.—Same general character of work, but not so heavy as that described under straighteners' helpers (gaggers).

CHIPPERS.

See chippers, page 210.

CONVEYOR MEN; CRANEMEN; ENGINEERS, STATIONARY; GREASERS; LABORERS; UNCLASSIFIED.

See same occupations, pages 160 to 163.

EARNINGS AND HOURS AND DAYS OF WORK, BY OCCUPATIONS.

EARNINGS PER HOUR.

Data relative to earnings per hour for each occupation and each plant are shown in detail in Table I, Volume II, and for each occupation and each district in Table II. Table I shows for each plant separately customary number of working days per week, customary number of working hours per day, normal number of employees, average earnings per hour, and number of employees earning each classified amount per hour. Table II shows for each occupation and each district the number of plants reporting data, the number of employees included, and the average earnings per hour. The table is so arranged that a comparison is easily made of the earnings of time workers and of tonnage workers in the different occupations within each of the districts and also of the earnings of each of the two classes of workers in the several districts.

The tables here presented summarize the information concerning earnings. The table which follows is a summary of Table II with the exception that time and tonnage workers are not shown separately but are combined. The data are shown only for the principal districts, as the number of employees in the other districts, as has already been noted, is too small to admit of comparison.

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AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS, COMBINED), BY PRINCIPAL DISTRICTS—STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Occupations.	Eastern district.	Pittsburgh district.	Great Lakes and Middle West district.	Total, all districts.
Chargers:				
Plants	3	3	2	8
Employees	10	27	6	43
Average earnings per hour...cents	21.3	17.7	21.3	18.8
Charging-machine operators:				
Plants	.....	5	2	7
Employees	.....	22	14	36
Average earnings per hour...cents	.....	25.2	22.3	24.0
Chippers:				
Plants	1	2	2	5
Employees	4	36	18	58
Average earnings per hour...cents	16.5	22.1	17.7	20.3
Conveyor men:				
Plants	1	6	2	9
Employees	4	55	10	69
Average earnings per hour...cents	16.9	19.2	15.9	18.6
Cranemen:				
Plants	2	7	2	11
Employees	23	126	31	180
Average earnings per hour...cents	18.5	20.0	20.5	20.0
Door operators:				
Plants	3	3	1	7
Employees	5	21	2	28
Average earnings per hour...cents	10.7	9.6	11.3	9.9
Drillers and punchers:				
Plants	.....	2	2	5
Employees	.....	12	18	31
Average earnings per hour...cents	.....	16.9	17.9	17.5
Engineers, stationary:				
Plants	1	3	1	5
Employees	2	16	15	33
Average earnings per hour...cents	23.5	19.1	21.8	20.6
Finishers:				
Plants	.....	3	1	4
Employees	.....	5	2	7
Average earnings per hour...cents	.....	25.3	27.5	25.9
Greasers:				
Plants	1	6	3	10
Employees	2	30	20	52
Average earnings per hour...cents	18.1	18.5	17.8	18.2
Heaters:				
Plants	4	8	3	16
Employees	10	49	8	71
Average earnings per hour...cents	49.8	42.3	47.7	43.6
Heaters' helpers:				
Plants	4	6	3	14
Employees	32	87	17	142
Average earnings per hour...cents	25.4	24.8	18.8	23.9
Hotbed men:				
Plants	3	7	3	14
Employees	33	59	43	143
Average earnings per hour...cents	17.5	24.8	16.9	20.5
Laborers:				
Plants	3	7	3	13
Employees	87	316	427	830
Average earnings per hour...cents	15.1	16.5	15.7	16.0
Roll engineers:				
Plants	4	6	.....	10
Employees	11	30	.....	41
Average earnings per hour...cents	31.4	26.4	.....	27.4
Rollers:				
Plants	4	8	1	14
Employees	9	27	4	41
Average earnings per hour...cents	68.3	66.4	55.0	65.1
Roll hands:				
Plants	4	7	3	15
Employees	34	69	61	169
Average earnings per hour...cents	30.2	30.6	29.6	32.5
Roughers:				
Plants	.....	4	1	5
Employees	.....	26	8	34
Average earnings per hour...cents	.....	30.4	27.5	29.7

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AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS, COMBINED), BY PRINCIPAL DISTRICTS—STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS—Concluded.

Occupations.	Eastern district.	Pittsburgh district.	Great Lakes and Middle West district.	Total, all districts.
Saw men, cold:				
Plants	1	4	2	7
Employees	2	35	7	44
Average earnings per hour.....cents.	17.5	29.5	19.5	27.2
Saw men, hot:				
Plants	3	4	2	9
Employees	6	20	12	38
Average earnings per hour.....cents.	23.1	29.4	22.6	26.2
Shearmen:				
Plants	1	5	3	9
Employees	6	14	22	42
Average earnings per hour.....cents.	22.0	26.9	19.9	22.5
Shearmen's and saw men's helpers:				
Plants	2	6	2	10
Employees	29	117	38	184
Average earnings per hour.....cents.	17.1	21.8	16.4	19.9
Stampers:				
Plants	.....	6	2	8
Employees	.....	26	10	36
Average earnings per hour.....cents.	.....	20.9	14.7	19.2
Stockers:				
Plants	1	4	1	6
Employees	34	118	5	157
Average earnings per hour.....cents.	16.0	18.7	19.0	18.3
Straighteners:				
Plants	2	6	3	12
Employees	20	32	29	81
Average earnings per hour.....cents.	28.0	35.3	20.4	30.2
Straighteners' helpers:				
Plants	2	6	3	11
Employees	32	44	43	119
Average earnings per hour.....cents.	17.1	22.0	16.7	18.9
Table lever men:				
Plants	2	6	2	10
Employees	12	50	30	92
Average earnings per hour.....cents.	27.6	32.2	32.8	31.9
Table men:				
Plants	2	3	2	7
Employees	8	20	17	45
Average earnings per hour.....cents.	19.6	26.8	17.4	22.6
Unclassified:				
Plants	3	8	3	15
Employees	62	155	81	312
Average earnings per hour.....cents.	19.3	19.7	20.6	19.6

More than one-half (52.03 per cent) of the 3,160 employees in the special iron and steel occupations in the structural, light rail, and other shape mills were in the Pittsburgh district, although considerable numbers were reported in the Great Lakes and Middle West district and in the Eastern district. One plant in one of the other districts is not shown, although it is included in the total. A comparison can best be made in the case of the Pittsburgh and the Great Lakes and Middle West districts, in which the largest numbers were reported. In most of the occupations the Pittsburgh district reported decidedly higher average earnings, as is shown in the above table. This is true not only in the case of the more highly skilled occupations, but also in the case of the unskilled employees, as, for example, in the case of laborers. The occupation reporting the lowest average earnings per hour, that of door operators, was largely filled by boys, although, in one or two cases, adult employees were reported.

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The next table compares the earnings of time workers and of tonnage workers. The number of time workers, it may be noted, is almost three times as great as that of tonnage workers, the majority of the unskilled employees being included in the former group. Nevertheless, considering the separate occupations, the tonnage workers in every case received a greater amount per hour. This is true not only in the more highly skilled occupations, such as rollers, but also in such low-paid occupations as shearmen and saw men's helpers.

COMPARISON OF AVERAGE EARNINGS PER HOUR OF TIME WORKERS AND OF TONNAGE WORKERS, BY OCCUPATIONS—STRUCTURAL LIGHT RAIL, AND OTHER SHAPE MILLS.

Occupations.	Time.			Tonnage.			Time and tonnage combined.		
	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.
Chargers	6	36	$0.183	2	7	$0.222	8	43	$0.188
Charging-machine operators	6	20	.194	5	16	.296	7	36	.249
Chippers	5	44	.177	1	14	.290	5	58	.203
Conveyor men	8	35	.167	5	34	.205	9	69	.186
Cranemen	10	130	.192	7	50	.221	11	180	.200
Door operators	7	28	.099	.....	.....	.....	7	28	.099
Drillers and punchers	5	31	.175	.....	.....	.....	5	31	.175
Engineers, stationary	5	33	.206	.....	.....	.....	5	33	.206
Finishers	3	5	.257	1	2	.266	4	7	.259
Greasers	10	47	.177	3	5	.239	10	52	.182
Heaters	9	18	.359	10	53	.462	16	71	.436
Heaters' helpers	11	59	.190	8	83	.271	14	142	.239
Hotbed men	11	89	.169	5	54	.260	14	143	.205
Laborers	13	830	.160	.....	.....	.....	13	830	.160
Roll engineers	9	34	.258	2	7	.375	10	41	.274
Rollers	7	9	.575	10	32	.669	14	41	.651
Roll hands	13	87	.255	9	82	.394	15	169	.325
Roughers	3	20	.240	2	14	.375	5	34	.297
Saw men, cold	6	18	.199	3	26	.325	7	44	.272
Saw men, hot	5	15	.218	4	23	.294	9	38	.262
Shearmen	6	26	.203	5	16	.259	9	42	.225
Shearmen's and saw men's helpers	9	123	.173	2	61	.264	10	184	.199
Stampers	7	24	.157	2	12	.266	8	36	.192
Stockers	5	134	.171	2	23	.261	6	157	.183
Straighteners	10	47	.277	6	36	.327	12	83	.302
Straighteners' helpers	8	93	.169	4	26	.247	11	119	.189
Table lever men	4	24	.244	8	68	.347	10	92	.319
Table men	5	27	.186	2	18	.271	7	45	.226
Unclassified	15	248	.182	7	64	.257	15	312	.196

The next table shows for each of the principal occupations average earnings per hour and the per cent of employees earning each classified amount per hour. The occupations are in order following the processes of manufacture.

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PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS—STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Stockers	6	157	$0.183	.....	.....	17.83	58.60	7.64	7.64	5.73	2.55	.....	.....	.....	.....
Heaters	16	71	.436	.....	.....	.....	.....	.....	.....	4.23	47.89	18.31	22.54	7.04	.....
Heaters' helpers	14	142	.239	.....	.....	2.82	19.01	13.38	22.54	20.42	21.83	.....	.....	.....	.....
Roll engineers	10	41	.274	.....	.....	.....	.....	4.88	26.83	46.34	17.07	4.88	.....	.....	.....
Rolling crew:															
Rollers	14	41	.651	.....	.....	.....	.....	.....	.....	.....	9.76	9.76	17.07	21.95	41.46
Roughers	5	34	.297	.....	.....	.....	23.53	.....	.....	26.47	38.24	11.76	.....	.....	.....
Table levermen	10	92	.319	.....	.....	.....	4.35	2.17	20.65	26.09	22.83	17.39	6.52	.....	.....
Finishers	4	7	.259	.....	.....	.....	.....	28.57	.....	57.14	14.29	.....	.....	.....	.....
Table men	7	45	.226	.....	.....	11.11	8.89	28.89	8.89	40.00	2.22	.....	.....	.....	.....
Roll hands, other	15	169	.325	.....	.....	.....	4.14	1.78	19.53	21.89	39.64	7.10	3.55	2.37	.....
Hotbed men	14	143	.205	.....	2.10	19.58	30.07	17.48	4.20	20.98	5.59	.....	.....	.....	.....
Shearmen	9	42	.225	.....	.....	.....	19.05	23.81	33.33	14.29	9.52	.....	.....	.....	.....
Saw men, hot	9	38	.262	.....	.....	.....	7.89	5.26	42.11	18.42	26.32	.....	.....	.....	.....
Saw men, cold	7	44	.272	.....	.....	2.27	13.64	13.64	6.82	27.27	27.27	9.09	.....	.....	.....
Shearmen's and saw men's helpers	10	184	.199	.....	.....	7.61	48.37	10.87	10.33	17.39	5.43	.....	.....	.....	.....
Straighteners	12	83	.302	.....	.....	.....	2.41	8.43	28.92	20.48	24.10	8.43	2.41	.....	4.82
Straighteners' helpers	11	119	.189	.....	.....	13.45	53.78	19.33	3.36	6.72	3.36	.....	.....	.....	.....
Cranemen	11	180	.200	.....	.....	1.11	13.33	46.67	35.56	3.33	.....	.....	.....	.....	.....
Laborers	13	830	.160	.....	.12	44.70	52.89	2.29	.....	.....	.....	.....	.....	.....	.....
Other occupations	.....	698	.193	8.31	2.58	4.58	28.37	23.93	18.77	8.45	4.87	.14	.....	.....	.....
Total, all occupations	16	3,160	.216	1.84	.70	15.85	22.22	13.16	12.41	10.41	9.02	1.99	1.17	.57	.66

The rollers in these mills, it will be noted, were exceptionally well paid. More than 40 per cent earned 70 cents or more per hour. It may be noted, however, that the rollers constitute only 1.30 per cent of the total number of employees, and, furthermore, that their duties are almost altogether supervisory.

The lowest-paid employees shown in the above table are the laborers, whose average earnings per hour were 16 cents; more than 97 per cent of the 830 laborers earned 14 and under 18 cent..

The next summary shows for each of the districts the number of plants reporting, the normal number of employees, the average earnings per hour, and the number of employees earning each classified amount per hour. Time workers and tonnage workers are shown separately and the two classes are also combined.

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NUMBER OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS, BY PRINCIPAL DISTRICTS—STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Number of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
TIME WORKERS.															
Eastern	4	337	$0.180	4	5	163	63	28	51	4	14	2	2	.....	1
Pittsburgh	8	1,032	.182	42	8	94	536	184	95	45	21	3	2	1	1
Great Lakes and Middle West	3	924	.180	4	4	228	399	117	97	53	17	5	.....	.....	.....
Total, all districts	16	2,334	.181	58	20	500	1,001	329	246	107	54	10	6	1	2
TONNAGE WORKERS.															
Eastern	2	140	.298	.....	2	1	5	27	35	22	33	3	5	4	3
Pittsburgh	7	612	.317	.....	.....	.....	12	52	87	184	190	48	14	9	16
Great Lakes and Middle West	2	74	.330	.....	.....	.....	.....	8	24	16	8	2	12	4	.....
Total, all districts	11	826	.316	.....	2	1	17	87	146	222	231	53	31	17	19
TIME AND TONNAGE WORKERS.															
Eastern	4	477	.216	4	7	164	68	55	86	26	47	5	7	4	4
Pittsburgh	8	1,644	.232	42	8	94	548	236	182	229	211	51	16	10	17
Great Lakes and Middle West	3	998	.192	4	4	228	399	125	121	69	25	7	12	4	.....
Total, all districts	16	3,160	.216	58	22	501	1,018	416	392	329	285	63	37	18	21

The average earnings of the 2,334 employees paid on the time basis were 18.1 cents per hour, while those of the 826 employees paid on the tonnage basis were 31.6 cents per hour, which is approximately 75 per cent higher than the average earnings of the time workers. This is due not only to the fact that a larger proportion of the unskilled laborers are included among the time workers, but also to the fact that in the separate occupations the employees paid on the tonnage basis received a much higher rate per hour than the time-workers.

The lowest rate reported was less than 12 cents per hour and the highest considerably above 70 cents per hour. Less than 1 per cent of all employees, however, received as much as 70 cents per hour, and less than 2 per cent earned less than 12 cents per hour. Almost one-third of the total number of employees, 32.22 per cent, were reported as earning 16 and under 18 cents per hour.

The large proportion of laborers and other unskilled employees reported in the structural mills as compared with the other rolling mills is due to the fact that the product of the structural mills is

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roughly finished and a great many unskilled employees are utilized in straightening and punching.

The table which follows shows for the time workers and tonnage workers combined the per cent of employees earning each classified amount per hour. Only the principal districts are shown, although the total includes all employees in all of the districts.

[PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS, BY PRINCIPAL DISTRICTS—STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Eastern	4	477	$0.216	0.84	1.47	34.38	14.26	11.53	18.03	5.45	9.85	1.05	1.47	0.84	0.84
Pittsburgh	8	1,644	.252	2.55	.49	5.72	33.33	14.36	11.07	13.93	12.83	3.10	.97	.61	1.03
Great Lakes and Middle West	3	998	.192	.40	.40	22.85	39.98	12.53	12.12	6.91	2.51	.70	1.20	.40	.....
Total, all districts	16	3,160	.216	1.84	.70	15.85	32.22	13.16	12.41	10.41	9.02	1.99	1.17	.57	.06

From the above table it may be seen that there is a considerable difference between the principal districts, not only as regards average earnings, but as regards the distribution of employees under the different classified rates of earnings. In the Pittsburgh district, for example, the average earnings per hour are 1.6 cents higher than in the Eastern district and 4 cents higher than in the Great Lakes and Middle West district. It may be noted, however, that there is a considerably larger proportion in the Eastern district earning less than 16 cents per hour than in the Great Lakes and Middle West district, the higher average in the Eastern district being due largely to the presence of a considerable proportion who earn 30 cents and more per hour.

The general distribution of earnings in all districts is most conveniently shown in the summary which follows by means of cumulative percentages. From this table it may be seen that over half of the employees, 50 61 per cent, earned less than 18 cents per hour, and more than three-fourths, 76.18 per cent, earned less than 25 cents per hour.

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PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR—STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

Earnings per hour.	Number of employees.	Per cent of total number of employees.	Earnings per hour.	Number of employees.	Per cent of total number of employees.
Under 16 cents	581	18.39	Under 30 cents	2,736	86.59
Under 18 cents	1,599	50.61	Under 40 cents	3,021	95.61
Under 20 cents	2,015	63.77	Under 50 cents	3,084	97.60
Under 25 cents	2,407	76.18			

A comparison of the earnings in the principal districts may most conveniently be made from the table which follows. This table shows by means of cumulative percentages the proportion of the employees earning under each specified amount per hour.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY PRINCIPAL DISTRICTS—STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning per hour—						
			Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
Eastern	477	$0.216	36.69	50.95	62.48	80.51	85.96	95.81	96.86
Pittsburgh	1,644	.232	8.76	42.09	56.45	67.52	81.45	94.28	97.38
Great Lakes and Middle West	998	.192	23.65	63.63	76.16	88.28	95.19	97.70	98.40
Total, all districts	3,160	.216	18.39	50.61	63.77	76.18	86.59	95.61	97.60

The average earnings per hour of the 3,160 employees in the 16 structural, light rail, and other shape mills were 21.6 cents. Of the three principal districts the highest average was found in the Pittsburgh district and the lowest in the Great Lakes and Middle West district.

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working hours per week are presented in detail for each occupation and in each plant in Table I, Volume II of this report. These data are summarized in the tables which follow. The first of these tables shows for each occupation the number of plants reporting, the normal number of employees, the average customary working hours per week, and the number of employees whose customary working time was each classified number of hours per week.

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NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK—STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Chargers	8	43	67.1	.....	.....	3	2	19	19	.....	.....	.....
Charging-crane and charging-machine operators	7	36	72.0	.....	.....	.....	.....	4	30	.....	2	.....
Chippers	5	58	70.7	.....	.....	.....	12	4	33	4	5	.....
Conveyor men	9	69	69.9	.....	.....	8	.....	10	47	.....	4	.....
Cranemen	11	180	73.6	.....	.....	.....	1	21	118	6	34	.....
Door operators	7	28	57.7	15	.....	.....	.....	6	7	.....	.....	.....
Drillers and punchers	5	31	66.2	.....	.....	.....	17	.....	12	.....	2	.....
Engineers, stationary	5	33	81.1	.....	.....	.....	.....	.....	6	4	23	.....
Finishers	4	7	62.4	.....	.....	1	2	4	.....	.....	.....	.....
Greasers	10	52	73.8	.....	.....	.....	2	4	33	2	11	.....
Heaters	16	71	66.0	15	.....	1	5	12	30	2	6	.....
Heaters' helpers	14	142	66.6	15	.....	.....	15	44	62	.....	6	.....
Hotbed men	14	143	67.4	6	.....	12	32	25	52	.....	16	.....
Laborers	13	830	73.0	.....	.....	58	100	42	373	13	244	.....
Roll engineers	10	41	71.6	.....	.....	.....	1	11	23	2	4	.....
Rollers	14	41	69.9	.....	.....	2	2	10	25	.....	2	.....
Roll hands	15	169	67.1	6	.....	12	35	29	80	.....	7	.....
Roughers	5	34	67.6	.....	.....	4	8	8	8	.....	6	.....
Saw men, cold	7	44	73.2	.....	.....	1	.....	2	33	4	4	.....
Saw men, hot	9	38	67.9	6	.....	.....	1	5	23	1	2	.....
Shearmen	9	42	69.0	.....	.....	6	8	6	14	.....	8	.....
Shearmen's and sawmen's helpers	10	184	68.3	.....	.....	19	16	38	101	10	.....	.....
Stampers	8	36	69.2	6	.....	.....	.....	4	20	.....	6	.....
Stockers	6	157	68.3	9	.....	32	.....	2	103	4	7	.....
Straighteners	12	83	67.0	4	.....	16	7	10	38	.....	8	.....
Straighteners' helpers	11	119	65.6	.....	.....	33	18	12	54	.....	2	.....
Table lever men	10	92	70.8	.....	.....	.....	.....	18	74	.....	.....	.....
Table men	7	45	69.8	.....	.....	.....	16	6	11	.....	12	.....
Unclassified	15	312	70.0	18	8	40	21	30	114	10	71	.....
Total, all occupations	16	3,160	70.0	100	8	248	321	386	1,543	62	492	.....

The table which follows shows for each of the principal occupations the per cent of employees customarily working each classified number of hours per week:

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PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK—STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Stockers	6	157	68.3	5.73	.....	20.38	.....	1.27	65.61	2.55	4.46	.....
Heaters	16	71	66.0	21.13	.....	1.41	7.04	16.90	42.25	2.82	8.45	.....
Heaters' helpers	14	142	66.6	10.56	.....	.....	10.56	30.99	43.66	.....	4.23	.....
Roll engineers	10	41	71.6	.....	.....	.....	2.44	26.83	56.10	4.88	9.76	.....
Rolling crew:												
Rollers	14	41	69.9	.....	.....	4.88	4.88	24.39	60.98	.....	4.88	.....
Roughers	5	34	67.6	.....	.....	11.76	23.53	23.53	23.53	.....	17.65	.....
Table lever men	10	92	70.8	.....	.....	.....	.....	19.57	80.43	.....	.....	.....
Finishers	4	7	62.4	.....	.....	14.29	28.57	57.14	.....	.....	.....	.....
Table men	7	45	69.8	.....	.....	.....	35.56	13.33	24.44	.....	26.67	.....
Roll hands, other	15	109	67.1	3.55	.....	7.10	20.71	17.16	47.34	.....	4.14	.....
Hotbed men	14	143	67.4	4.20	.....	8.39	22.38	17.48	36.36	.....	11.19	.....
Shearmen	9	42	69.0	.....	.....	14.29	19.05	14.29	33.33	.....	19.05	.....
Saw men, hot	9	38	67.9	15.79	.....	.....	2.63	13.16	60.53	2.63	5.26	.....
Saw men, cold	7	44	73.2	.....	.....	2.27	.....	4.55	75.00	9.09	9.09	.....
Shearmen's and sawmen's helpers	10	184	68.3	.....	.....	10.33	8.70	20.65	54.89	5.43	.....	.....
Straighteners	12	83	67.0	4.82	.....	19.28	8.43	12.05	45.78	.....	9.64	.....
Straighteners' helpers	11	119	65.6	.....	.....	27.73	15.13	10.08	45.38	.....	1.68	.....
Cranemen	11	180	73.6	.....	.....	.....	.56	11.67	65.56	3.33	18.89	.....
Laborers	13	830	73.0	.....	.....	6.99	12.05	5.00	44.94	1.57	29.40	.....
Other occupations	.....	698	70.1	5.59	1.15	7.31	7.74	11.60	45.99	2.87	17.77	.....
Total, all occupations	16	3,160	70.0	3.16	.25	7.85	10.16	12.22	48.83	1.96	15.57	.....

It will be noted that in all but three of the occupations some part of the employees were working 84 hours. This was due not only to the fact that some of the plants were being operated for 7 days per week, but also to the fact that in certain occupations, such as laborers and cranemen, the employees were required to be on duty when the mill was not in operation. More than one-fifth of the heaters, 21.13 per cent, were employed for 48 hours per week or less. In all the occupations, however, the majority of the employees worked from 60 and 72 hours per week, inclusive.

The table which follows shows for each of the principal occupations the per cent of employees whose customary working time was 72 hours and over per week and also the per cent whose customary working time was 84 hours per week.

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PER CENT OF EMPLOYEES IN THE PRINCIPAL OCCUPATIONS CUSTOMARILY WORKING 72 HOURS AND OVER PER WEEK—STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

Occupations.	Normal number of employees.	Per cent of employees whose customary working hours per week were—	
		72 and over.	84.
Stockers	157	72.62	4.46
Heaters	71	53.52	8.45
Heaters' helpers	142	47.89	4.23
Roll engineers	41	70.74	9.76
Rolling crews:			
Rollers	41	65.86	4.88
Roughers	34	41.18	17.65
Table lever men	92	80.43	.....
Finishers	7	.....	.....
Table men	45	51.11	26.67
Roll hands, other	169	51.48	4.14
Hotbed men	143	47.55	11.19
Shearmen	42	52.38	19.05
Saw men, hot	38	68.42	5.26
Saw men, cold	44	93.18	9.09
Shearmen's and saw-men's helpers	184	60.32	.....
Straighteners	83	55.42	9.64
Straighteners' helpers	119	47.06	1.68
Cranemen	180	87.78	18.89
Laborers	830	75.91	20.40
Other occupations	698	66.63	17.77
Total, all occupations	3,160	66.36	15.57

The next table is a summary showing the number of employees working each classified number of hours per week for the principal districts. The time workers and the tonnage workers are shown separately:

NUMBER OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK, BY PRINCIPAL DISTRICTS—STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS:

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
TIME WORKERS.												
Eastern	4	337	60.8	.....	8	196	38	77	14	1	3	.....
Pittsburgh	8	1,032	71.2	15	.....	52	29	115	686	35	100	.....
Great Lakes and Middle West	3	924	72.9	.....	.....	.....	213	11	411	.....	289	.....
Total, all districts	16	2,334	70.1	15	8	248	321	203	1,111	36	392	.....
TONNAGE WORKERS.												
Eastern	2	140	66.3	.....	.....	.....	.....	138	2	.....	.....	.....
Pittsburgh	7	612	69.8	85	.....	.....	.....	45	381	26	75	.....
Great Lakes and Middle West	2	74	76.1	.....	.....	.....	.....	.....	49	.....	25	.....
Total, all districts	11	826	69.7	85	.....	.....	.....	183	432	26	100	.....
TIME AND TONNAGE WORKERS.												
Eastern	4	477	62.4	.....	8	196	38	215	16	1	3	.....
Pittsburgh	8	1,644	70.6	100	.....	52	29	160	1,067	61	175	.....
Great Lakes and Middle West	3	998	73.1	....	.....	.....	213	11	460	.....	314	.....
Total, all districts	16	3,160	70.0	100	8	248	321	386	1,543	62	492	.....

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There was almost no difference, it may be noted, between the average customary hours per week for the employees paid on the time basis and those paid on the tonnage basis. A much larger proportion, however, of the tonnage workers were employed 48 hours and less per week than of the time workers.

The table which follows shows for time workers and tonnage workers combined the per cent of employees customarily working each classified number of hours per week in each of the three principal districts and in all districts. The number of employees in the other district is too small to be shown separately, although it is included in the total.

PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK, BY PRINCIPAL DISTRICTS—STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Eastern	4	477	62.4	.....	1.68	41.09	7.97	45.07	3.35	0.21	0.63	.....
Pittsburgh	8	1,644	70.6	6.08	.....	3.16	1.76	9.73	64.90	3.71	10.64	.....
Great Lakes and Middle West	3	998	73.1	.....	.....	.....	21.34	1.10	46.09	.....	31.46	.....
Total, all districts	16	3,160	70.0	3.16	0.25	7.85	10.16	12.22	48.83	1.96	15.57	.....

The customary working hours per week were 72 and over for 66.36 per cent or nearly two-thirds of the total number of employees. There is a striking difference between the average working hours for the different districts. In the Eastern district less than 5 per cent of the total employees worked 72 hours or more per week, while in the other two districts over three-fourths of the total number of employees worked 72 hours per week.

The average customary working time per week for the 3,160 employees in the special iron and steel occupations in 16 structural, light rail, and other shape mills was 70 hours—an unusually large number for rolling mills. Of the employees in all districts 88.74 per cent worked 60 hours or more per week.

DAYS WORKED PER WEEK.

Under each occupation the customary working days or turns per week are shown for each plant in Table I, Volume II of this report. These data are briefly summarized here. The table which follows shows for each occupation the number of plants reporting,

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the normal number of employees, and the number of employees whose customary working time was each specified number of days or turns per week.

NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK—STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

Occupations.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Chargers	8	43	.....	16	27	.....	.....
Charging-machine operators	7	36	.....	4	30	.....	2
Chippers	5	58	.....	.....	49	4	5
Conveyer men	9	69	.....	12	53	.....	4
Cranemen	11	180	.....	12	[1] 128	6	34
Door operators	7	28	.....	4	24	.....	.....
Drillers and punchers	5	31	.....	.....	29	.....	2
Engineers, stationary	5	33	.....	.....	6	4	23
Finishers	4	7	.....	6	1	.....	.....
Greasers	10	52	.....	4	35	2	11
Heaters	16	71	.....	8	55	2	6
Heaters' helpers	14	142	.....	32	104	.....	6
Hotbed men	14	143	1	44	82	.....	16
Laborers	13	830	.....	124	447	13	246
Roll engineers	10	41	.....	8	[1] 27	2	4
Rollers	14	41	1	6	32	.....	2
Roll hands	15	169	.....	49	113	.....	7
Roughers	5	34	.....	16	12	.....	6
Saw men, cold	7	44	.....	.....	36	4	4
Saw men, hot	9	38	.....	2	34	.....	2
Shearmen	9	42	.....	20	14	.....	8
Shearmen's and saw men's helpers	10	184	.....	61	113	10	.....
Stampers	8	36	.....	4	26	.....	6
Stockers	6	157	.....	34	112	4	7
Straighteners	12	83	.....	23	52	.....	8
Straighteners' helpers	11	119	.....	58	59	.....	2
Table lever men	10	92	.....	8	84	.....	.....
Table men	7	45	.....	18	15	.....	12
Unclassified	15	312	1	59	167	9	76
Total, all occupations	16	3,160	3	632	[2] 1,966	60	499

[1] Including 2 employees who worked alternately 5 and 7 days.
[2] Including 4 employees who worked alternately 5 and 7 days.

The customary working time was 6 days or turns per week for 1,966, or 62.22 per cent, of the 3,160 employees reported in the special iron and steel occupations in structural mills. One-fifth of the employees worked 5 and 6 days or turns per week, alternately, and almost one-sixth, 15.79 per cent, of the total number worked 7 days or turns per week.

The table which follows shows the per cent of employees in the principal occupations in structural mills customarily working each specified number of days or turns per week. The occupations are presented in the order of the processes of manufacture:

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PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK—STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

Occupations.	Number of plants.	Normal number of employees.	Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Stockers	6	157	.....	21.66	71.34	2.55	4.46
Heaters	16	71	.....	11.27	77.46	2.82	8.45
Heaters' helpers	14	142	.....	22.54	73.24	.....	4.23
Roll engineers	10	41	.....	19.51	[1]65.85	4.88	9.76
Rolling crews:							
Rollers	14	41	2.44	14.63	78.05	.....	4.88
Roughers	5	34	.....	47.06	35.29	.....	17.65
Table lever men	10	92	.....	8.70	91.30	.....	.....
Finishers	4	7	.....	85.71	14.29	.....	.....
Table men	7	45	.....	40.00	33.33	.....	26.67
Roll hands, other	15	169	.....	28.99	66.86	.....	4.14
Hotbed men	14	143	.70	30.77	57.34	.....	11.19
Shearmen	9	42	.....	47.62	33.33	.....	19.05
Saw men, hot	9	38	.....	5.26	89.47	.....	5.26
Saw men, cold	7	44	.....	.....	81.82	9.09	9.09
Shearmen's and saw men's helpers	10	184	.....	33.15	61.41	5.43	.....
Straighteners	12	83	.....	27.71	62.65	.....	9.64
Straighteners' helpers	11	119	.....	48.74	49.58	.....	1.68
Cranemen	11	180	.....	6.67	[1]71.11	3.33	18.89
Laborers	13	830	.....	14.94	53.86	1.57	29.64
Other occupations	.....	698	.14	14.76	63.90	2.72	18.48
Total, all occupations	16	3,160	.09	20.00	[2]62.22	1.90	15.79

[1] Including 2 employees who worked alternately 5 and 7 days.
[2] Including 4 employees who worked alternately 5 and 7 days.

A larger proportion of the laborers than of the employees in any other occupation worked 7 days or turns per week. In that occupation 29.64 per cent of the employees customarily worked 7 days or turns. The differences which exist between the other occupations are largely explained by the fact that different proportions of employees in the various occupations were reported in the mills working different number of days per week.

The table which follows shows for each of the principal districts the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY PRINCIPAL DISTRICTS—STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Eastern	4	477	2	281	191	.....	3	0.42	58.91	40.04	.....	0.63
Pittsburgh	8	1,644	1	152	[1]1,250	60	181	.06	9.25	[1]76.03	3.65	11.01
Great Lakes and Middle West	3	998	.....	199	484	.....	315	.....	19.94	48.50	.....	31.56
Total, all districts	16	3,160	3	632	[1]1,966	60	499	.09	20.00	[1]62.22	1.90	15.79

[1] Including 4 employees who worked alternately 5 and 7 days.

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MISCELLANEOUS MECHANICAL MILLS.

INTRODUCTION.

The data relative to earnings and hours of work are summarized briefly in the pages immediately following and analyzed in more detail on pages 245 to 257.

SUMMARY OF EARNINGS AND HOURS AND DAYS OF WORK.

EARNINGS.

Data relative to earnings in miscellaneous mechanical mills were reported for 2,869 employees in special iron and steel occupations in 27 plants. The average earnings per hour for the 2,869 employees were 23.7 cents. Of the total employees 95.26 per cent were in the Pittsburgh and Great Lakes and Middle West districts. The average earnings were practically the same in those two districts. The number of employees included from each of the other three districts is so small that neither the average earnings nor the classified earnings are of any significance, and consequently they are not shown separately.

Of the 2,869 employees included in this report on miscellaneous mechanical mills, 36.60 per cent earned 16 and under 18 cents per hour, 18.09 per cent earned 20 and under 25 cents per hour, and 10.84 per cent earned 18 and under 20 cents per hour. The per cent of employees earning each classified amount per hour in the principal districts and for the total of all districts is shown in the table which follows:

PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY PRINCIPAL DISTRICTS—MISCELLANEOUS MECHANICAL MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.								
			Under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 cents and over.
Pittsburgh	1,541	$0.239	2.14	4.09	38.03	11.10	16.29	8.37	8.76	4.74	6.48
Great Lakes and Middle West	1,192	.235	1.17	6.12	36.07	10.49	20.89	8.98	5.37	5.29	5.63
Total, all districts	2,869	.237	1.71	5.51	36.60	10.84	18.09	8.82	7.77	4.78	5.88

The summary in the form of cumulative percentages which follows shows that 43.81 per cent of all employees earned less than 18 cents per hour; 54.65 per cent earned less than 20 cents per hour, and 72.74 per cent earned less than 25 cents per hour.

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PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR BY PRINCIPAL DISTRICTS—MISCELLANEOUS MECHANICAL MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning per hour—							
			Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
Pittsburgh	1,541	$0.239	2.14	6.23	44.26	55.36	71.65	80.02	88.78	93.52
Great Lakes and Middle West.	1,192	.235	1.17	7.29	43.36	53.85	74.74	83.72	89.09	94.38
Total, all districts	2,869	.237	1.71	7.22	43.82	54.66	72.75	81.57	89.34	94.12

The number of employees reported from the New England district, the Eastern district, and the Southern district is too small to be of any value for purposes of comparison, and these districts are therefore not shown in detail in the table, although included in the total. The average earnings and the classified earnings from the Pittsburgh district and the Great Lakes and Middle West district show a remarkable agreement. The difference in the average earnings per hour is only 0.4 cents, and there are but slight differences in the per cent of employees within each of the classified groups. More than one-half of the employees in each of the districts earned less than 20 cents per hour, the percentages being 55.36 for the Pittsburgh district and 53.85 for the Great Lakes and Middle West district.

HOURS OF LABOR.

Customary working hours per full week were reported for 2,869 employees in special iron and steel occupations in 27 plants. The average hours per week were 70.2. Of all employees, 43.64 per cent worked 72 hours per week and 33.98 per cent worked over 60 and under 72 hours per week.

The per cent of employees working each classified number of hours per week for the principal districts and for the total for all districts is shown in the following table:

PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY PRINCIPAL DISTRICTS—MISCELLANEOUS MECHANICAL MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—			
			60 and under.	Over 60 and under 72.	72	Over 72.
Pittsburgh	1,541	69.9	6.49	37.12	43.15	13.24
Great Lakes and Middle West	1,192	70.8	10.40	25.42	47.73	16.44
Total, all districts	2,869	70.2	8.40	33.98	43.64	13.98

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More than 95 per cent of the employees were in the Pittsburgh and Great Lakes and Middle West districts, and the other three districts have not been given in detail because of the small number involved, although they are included in the total. The average hours per week in those two districts were 69.9 and 70.8, respectively. In the Great Lakes and Middle West district 64.17 per cent of all employees worked 72 hours and over, and 11.58 per cent worked 84 hours. In the Pittsburgh district 56.39 per cent of all employees worked 72 hours and over and 4.41 per cent worked 84 hours. Considering all employees in the five districts 57.62 per cent worked 72 hours and over and 7.18 per cent worked 84 hours.

DAYS PER WEEK.

Six days or turns per week was the customary working time for 1,990 employees, or 69.36 per cent, of the 2,869 employees in the special iron and steel occupations in the 27 miscellaneous mechanical mill plants. Five and six turns alternating was the customary time for 483 employees, or 16.84 per cent of the total. Seven days or turns per week was the customary working time for 310 employees, or 10.81 per cent of the total, and 6 and 7 turns alternating was the customary working time for 80 employees, or 2.79 per cent of the total.

The following table shows for the total and for the principal districts the per cent of employees whose customary working time was 7 days or turns per week:

PER CENT OF EMPLOYEES WHOSE CUSTOMARY WORKING TIME PER WEEK WAS 7 DAYS OR TURNS, BY PRINCIPAL DISTRICTS—MISCELLANEOUS MECHANICAL MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Per cent of employees whose customary working time per week was 7 days.
Pittsburgh	1,541	7.40
Great Lakes and Middle West	1,192	16.44
Total, all districts	2,869	10.81

EARNINGS AND HOURS AND DAYS OF WORK, BY OCCUPATIONS.

EARNINGS PER HOUR.

Data relative to earnings per hour for each occupation and each plant are shown in detail in Table I, Volume II, and for each occupation and each district in Table II. Table I shows for each plant separately customary number of working days per week, customary number of working hours per day, normal number of employees, aver-

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age earnings per hour, and number of employees earning each classified amount per hour. Table II shows for each occupation and each district the number of plants reporting data, the number of employees included, and the average earnings per hour. The table is so arranged that a comparison is easily made of the earnings of time workers and of tonnage workers in the different occupations within each of the districts and also of the earnings of each of the two classes of workers in the several districts.

The tables here presented summarize the information concerning earnings. The table which follows is a summary of Table II with the exception that time workers and tonnage workers are not shown separately but are combined. The data are shown only for the principal districts, as the number of employees in the other districts, as has already been noted, is too small to admit of comparison.

AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY PRINCIPAL DISTRICTS — MISCELLANEOUS MECHANICAL MILLS..

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Occupations.	Pittsburgh district.	Great Lakes and Middle West district.	Total, all districts.
Chargers:			
Plants	2	4	6
Employees	4	27	31
Average earnings per hour.....cents..	19.1	20.1	20.0
Charging-crane and charging-machine operators:			
Plants	7	5	13
Employees	31	17	53
Average earnings per hour.....cents..	29.0	22.9	26.1
Cranemen:			
Plants	10	8	21
Employees	48	50	108
Average earnings per hour.....cents..	19.2	21.4	20.
Door operators:			
Plants	5	2	7
Employees	22	5	2.
Average earnings per hour.....cents..	15.5	15.5	15.5
Engineers, stationary:			
Plants	3	1	4
Employees	12	2	14
Average earnings per hour.....cents..	19.5	23.5	20.2
Greasers:			
Plants	10	7	17
Employees	54	28	82
Average earnings per hour.....cents..	17.7	18.7	18.0
Guide setters:			
Plants	7	5	12
Employees	57	26	83
Average earnings per hour.....cents..	34.8	38.2	35.8
Heaters:			
Plants	9	8	19
Employees	54	25	92
Average earnings per hour.....cents..	51.2	56.9	50.8
Heaters' helpers:			
Plants	9	8	19
Employees	110	49	190
Average earnings per hour.....cents..	26.9	32.9	28.2
Hotbed men:			
Plants	10	6	18
Employees	77	24	106
Average earnings per hour.....cents..	18.0	19.9	18.5
Laborers:			
Plants	11	10	23
Employees	346	332	699
Average earnings per hour.....cents..	17.0	16.5	16.8

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AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY PRINCIPAL DISTRICTS—MISCELLANEOUS MECHANICAL MILLS—Concluded.

Occupations.	Pittsburgh district.	Great Lakes and Middle West district.	Total, all districts
Lever men:			
Plants	10	9	20
Employees	93	33	128
Average earnings per hour.....cents..	22.2	23.9	22.5
Roll engineers:			
Plants	13	9	25
Employees	70	24	100
Average earnings per hour.....cents..	25.3	29.4	26.4
Rollers:			
Plants	14	9	25
Employees	47	22	73
Average earnings per hour.....cents..	60.6	78.9	65.3
Rollers' helpers:			
Plants	8	7	15
Employees	22	18	40
Average earnings per hour.....cents..	39.5	46.0	42.6
Roll hands:			
Plants	11	8	22
Employees	89	100	216
Average earnings per hour.....cents..	29.1	28.2	27.5
Shearmen and saw men:			
Plants	14	10	27
Employees	86	67	157
Average earnings per hour.....cents..	26.6	24.5	25.5
Shearmen's and saw men's helpers:			
Plants	8	8	18
Employees	92	134	230
Average earnings per hour.....cents..	18.5	17.9	18.1
Stockers:			
Plants	6	4	10
Employees	51	8	59
Average earnings per hour.....cents..	18.4	20.4	18.7
Table lever men:			
Plants	9	8	18
Employees	66	49	123
Average earnings per hour.....cents..	24.5	29.9	26.9
Unclassified:			
Plants	12	8	21
Employees	110	152	262
Average earnings per hour.....cents..	19.2	20.1	19.7

Twenty-four of the 27 miscellaneous mechanical mills included in this report are located in the Pittsburgh district and in the Great Lakes and Middle West district. The other three plants are distributed in three districts and therefore those districts are not shown in detail throughout the report. All plants, however, are included in the total.

In the above table the employees are entered in 21 separate occupations, and in 15 of the 21 the average earnings per hour were lower in the Pittsburgh district than in the Great Lakes and Middle West district. The laborers, however, average one-half cent per hour lower in the Great Lakes and Middle West district than in the Pittsburgh district; the average hourly earnings in that occupation in the two districts were 16.5 cents and 17.0 cents, respectively.

In practically all of the higher-paid occupations, such as heaters and rollers, the average earnings were considerably lower in the Pittsburgh district than in the Great Lakes and Middle West district.

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The table which follows compares the earnings of time workers and of tonnage workers, by occupations:

COMPARISON OF AVERAGE EARNINGS PER HOUR OF TIME WORKERS AND OF TONNAGE WORKERS, BY OCCUPATIONS—MISCELLANEOUS MECHANICAL MILLS.

Occupations.	Time.			Tonnage.			Time and tonnage combined.		
	Number of plants.	Normal number of employes.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.
Chargers	5	22	$0.192	1	8	$0.226	6	31	$0.200
Charging-crane and charging-machine operators	6	20	.220	7	33	.292	13	53	.261
Cranemen	21	103	.200	.....	.....	.....	21	103	.200
Door operators	5	12	.133	3	15	.174	7	27	.155
Engineers, stationary	4	14	.202	.....	.....	.....	4	14	.202
Greasers	17	72	.177	2	10	.205	17	82	.180
Guide setters	6	22	.271	9	61	.394	12	83	.358
Heaters	7	20	.451	12	72	.526	19	92	.508
Heaters' helpers	8	34	.222	13	156	.297	19	190	.282
Hotbed men	13	63	.180	6	43	.192	18	106	.185
Laborers	23	699	.168	.....	.....	.....	23	699	.168
Lever men	15	72	.186	8	56	.285	20	128	.225
Roll engineers	23	91	.252	5	9	.374	25	100	.264
Rollers	12	38	.591	15	35	.726	25	73	.653
Rollers' helpers	5	12	.365	11	28	.456	15	40	.426
Roll hands	17	86	.206	11	130	.320	22	216	.275
Shearmen and saw men	18	90	.219	17	67	.305	27	157	.255
Shearmen's and saw men's helpers	16	195	.172	6	35	.236	18	230	.181
Stockers	9	37	.193	2	22	.178	10	59	.187
Table lever men	11	69	.224	12	54	.332	18	123	.260
Unclassified	20	218	.189	10	45	.241	21	263	.197

In every occupation, with the single exception of stockers, the average earnings of tonnage workers were higher, and in most cases much higher, than the average earnings of time workers. In some occupations the earnings of tonnage workers were more than 50 per cent higher than those of time workers. Thus of lever men the 72 time workers averaged only 18.6 cents per hour while the 56 tonnage workers averaged 28.5 cents; the 22 guide setters on time work averaged 27.1 cents and the 61 on tonnage work averaged 39.4 cents; the 17 roll hands on time work averaged 20.6 cents and the 11 on tonnage work averaged 32.0 cents. Cranemen, engineers, stationary, and laborers are the only occupations in which all employees worked on the time basis.

The next table shows for each of the principal occupations average earnings per hour and the per cent of employees earning each classified amount per hour. The occupations are in order following the processes of manufacture.

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PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS—MISCELLANEOUS MECHANICAL MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Heaters	19	92	$0.508	.....	.....	.....	.....	.....	1.09	.....	17.39	39.13	23.91	7.61	10.87
Heaters' helpers	19	190	.282	.....	.....	2.11	2.63	7.37	32.11	2.63	20.53	2.63	10.00	.....	.....
Roll engineers	25	100	.264	.....	.....	.....	.....	.....	45.00	49.00	.....	4.00	2.00	.....	.....
Rolling crew:															
Rollers	25	73	.653	.....	.....	.....	.....	.....	1.37	2.74	6.85	17.81	12.33	26.03	32.88
Rollers' helpers	15	40	.426	.....	.....	.....	.....	.....	15.00	10.00	10.00	32.50	10.00	5.00	17.50
Table lever men	18	122	.269	.....	9.76	1.63	11.38	5.69	14.63	22.76	20.33	4.88	8.94	.....	.....
Guide setters	12	83	.358	.....	.....	.....	4.82	2.41	6.02	22.89	33.73	9.64	10.87	3.61	.....
Roll hands, other	22	216	.275	.....	.....	5.56	8.33	10.19	29.17	15.28	14.81	10.19	6.48	.....	.....
Hotbed men	18	106	.185	.....	.....	12.26	43.40	21.70	20.75	.....	1.89	.....	.....	.....	.....
Shearmen and sawmen	27	157	.255	.....	.....	.....	4.46	20.38	33.12	14.01	21.02	7.01	.....	.....	.....
Shearmen's and sawmen's helpers	18	230	.181	0.87	1.30	2.17	66.09	14.35	6.96	6.96	1.30	.....	.....	.....	.....
Cranemen	21	103	.200	.....	.....	3.88	3.88	34.95	57.28	.....	.....	.....	.....	.....	.....
Laborers	23	699	.168	.....	.29	10.44	88.98	.29	.....	.....	.....	.....	.....	.....	.....
Other occupations	.....	657	.203	2.74	1.83	6.85	27.09	21.31	25.88	5.63	5.48	2.89	.30	.....	.....
Total, all occupations	27	2,869	.237	.70	1.01	5.51	36.60	10.84	18.09	8.82	7.77	4.78	3.38	1.08	1.43

The employees most closely connected with the productive processes in miscellaneous mechanical mills may be separated into principal groups—the heating crew and the rolling crew. The heater is a highly skilled and responsible workman and is virtually foreman of the heating crew. The roller is also a skilled and responsible workman and is foreman of the rolling crew.

The roller is the highest paid employee; the average for the 73 included in this report was 65.3 cents per hour, the lowest earnings reported for rollers were 20 and under 25 cents per hour and the highest reported $1.25 and over; 32.88 per cent earned 70 cents and over per hour.

The heater is the second highest paid employee; the average for the 92 was 50.8 cents per hour, the lowest earnings reported were 20 and under 25 cents per hour and the highest $1 and under $1.25; 10.87 per cent earned 70 cents and over per hour.

The occupation showing the lowest average earning is laborers. The 699 laborers included in the above table averaged 16.8 cents per hour; 88.98 per cent of the total number earned 16 and under 18 cents per hour and 10.44 per cent earned 14 and under 16 cents per hour; the lowest earnings reported were 12 and under 14 cents for only 2 employees and the highest 18 and under 20 cents for only 2 employees.

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The next summary shows for each of the two principal districts the number of plants reporting, normal number of employees, average earnings per hour, and number of employees earning each classified amount per hour. Time workers and tonnage workers are shown separately and the two classes are also combined.

NUMBER OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS, BY PRINCIPAL DISTRICTS—MISCELLANEOUS MECHANICAL MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Number of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
TIME WORKERS.															
Pittsburgh	14	929	$0.193	10	12	49	565	86	120	55	13	5	2	11	1
Great Lakes and Middle West	10	981	.204	6	8	73	423	125	217	74	10	23	4	6	7
Total, all districts	27	1,990	.199	16	22	144	1,019	220	344	138	27	29	6	17	8
TONNAGE WORKERS.															
Pittsburgh	13	612	.316	4	7	14	21	85	131	74	122	68	58	9	19
Great Lakes and Middle West	6	211	.391	.....	.....	.....	2	.....	32	33	54	40	31	5	14
Total, all districts	21	879	.332	4	7	14	31	91	175	115	196	108	91	14	33
TIME AND TONNAGE WORKERS.															
Pittsburgh	14	1,541	.239	14	19	63	586	171	251	129	135	73	60	20	20
Great Lakes and Middle West	10	1,192	.235	6	8	73	430	125	249	107	64	63	35	11	21
Total, all districts	27	2,869	.237	20	29	158	1,060	311	519	253	223	137	97	31	41

The average earnings per hour for the 1,990 time workers were 19.9 cents and for the 879 tonnage workers 33.2 cents. The marked difference in earnings of time workers and of tonnage workers is due in part to the fact that the proportion of skilled workers is much less among time workers than among tonnage workers, but, as has been noted on a preceding page, even in the same occupations the time workers receive much less than tonnage workers.

The lowest reported rate was under 10 cents per hour and the highest $1.25 and over per hour.

The table which follows shows the per cent of employees earning each classified amount per hour. The percentages are computed from the third section of the preceding table. Time workers and tonnage workers are combined.

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PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS, BY PRINCIPAL DISTRICTS—MISCELLANEOUS MECHANICAL MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Pittsburgh	14	1,541	$0.239	0.91	1.23	4.09	38.03	11.10	16.29	8.37	8.76	4.74	3.89	1.30	1.30
Great Lakes and Middle West	10	1,192	.235	.50	.67	6.12	36.07	10.49	20.89	8.98	5.37	5.29	2.94	.92	1.76
Total, all districts	27	2,869	.237	.70	1.01	5.51	36.60	10.84	18.09	8.82	7.77	4.78	3.38	1.08	1.43

The above table shows that 36.60 per cent of 2,869 employees earned 16 and under 18 cents per hour; 18.09 per cent earned 20 and under 25 cents, and 10.84 per cent 18 and under 20 cents. Under 16 cents per hour was earned by 7.22 per cent of the total number of employees, and 5.89 per cent earned 50 cents and over.

The Pittsburgh district and the Great Lakes and Middle West district show an unusual agreement not only in average earnings, but also in the proportion earning each classified amount per hour.

The summary in the form of cumulative percentages which follows shows that 43.82 per cent of the total number of employees earned less than 18 cents per hour, and 72.75 per cent earned less than 25 cents per hour. Only 10.66 per cent of the employees earned as much as 40 cents per hour.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR—MISCELLANEOUS MECHANICAL MILLS.

Earnings per hour.	Number of employees.	Per cent of total number of employees.	Earnings per hour.	Number of employees.	Per cent of total number of employees
Under 14 cents	49	1.71	Under 25 cents	2,087	72.75
Under 16 cents	207	7.22	Under 30 cents	2,340	81.57
Under 18 cents	1,257	43.82	Under 40 cents	2,563	89.34
Under 20 cents	1,568	54.66	Under 50 cents	2,700	94.12

The per cent of employees earning each classified amount per hour in each of the principal districts is shown by means of cumulative percentages in the table which follows. Of the total number of employees 95.26 per cent are in the two principal districts. The two districts show practically no variation either in average earnings per hour or in the per cent of employees earning each specified amount per hour.

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PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY PRINCIPAL DISTRICTS—MISCELLANEOUS MECHANICAL MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, al. districts."]

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning per hour—							
			Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
Pittsburgh	1,541	$0.239	2.14	6.23	44.26	55.36	71.65	80.02	88.78	93.52
Great Lakes and Middle West	1,192	.235	1.17	7.29	43.36	53.85	74.74	83.72	89.09	94.38
Total, all districts	2,869	.237	1.71	7.22	43.82	54.66	72.75	81.57	89.34	94.12

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working hours per week are presented in detail for each occupation and each plant in Table I, Volume II of this report. These data are summarized in the text tables which follow. The first of these tables shows for each occupation the number of plants reporting, the normal number of employees, the average customary working hours per week, and the number of employees whose customary working time was each classified number of hours per week.

NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK—MISCELLANEOUS MECHANICAL MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—							
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Chargers	6	31	74.2	.....	.....	.....	.....	4	15	12	.....	.....
Charging-crane and charging-machine operators	13	53	67.7	6	.....	.....	1	26	18	.....	2	.....
Cranemen	21	103	76.9	.....	.....	.....	.....	9	42	15	37	.....
Door operators	7	27	68.3	3	.....	.....	.....	12	12	.....	.....	.....
Engineers, stationary	4	14	74.0	.....	.....	.....	.....	8	2	2	2	.....
Greasers	17	82	75.3	.....	.....	.....	.....	10	37	8	27	.....
Guide setters	12	83	68.2	9	.....	.....	.....	25	38	6	5	.....
Heaters	19	92	69.0	3	1	3	1	58	22	4	.....	.....
Heaters' helpers	19	190	67.9	12	.....	.....	1	130	39	4	4	.....
Hotbed men	18	106	70.0	.....	.....	.....	3	54	38	9	2	.....
Laborers	23	699	71.3	.....	.....	.....	51	213	314	43	78	.....
Lever men	20	128	67.2	21	.....	.....	.....	34	53	16	4	.....
Roll engineers	25	100	74.8	.....	.....	.....	.....	11	46	29	14	.....
Rollers	25	73	68.5	6	1	.....	1	30	31	3	1	.....
Rollers' helpers	15	40	64.5	9	.....	.....	.....	16	11	2	2	.....
Roll hands	22	216	70.2	.....	.....	.....	9	106	94	4	3	.....
Shearmen and saw men	27	157	69.6	6	.....	.....	6	49	86	8	2	.....
Shearmen's and saw men's helpers	18	230	69.0	3	.....	.....	31	59	117	20	.....	.....
Stockers	10	59	69.4	.....	.....	.....	2	22	35	.....	.....	.....
Table lever men	18	123	67.3	18	.....	.....	.....	37	68	.....	.....	.....
Unclassified	21	263	70.4	9	.....	.....	25	62	134	10	23	.....
Total, all occupations	27	2,869	70.2	105	2	3	131	975	1,252	195	206	.....

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The table which follows shows for each of the principal occupations the per cent of employees customarily working each classified number of hours per week. The occupations are presented in the order of the processes of manufacture.

PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK—MISCELLANEOUS MECHANICAL MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Heaters	19	92	69.0	3.26	1.09	3.26	1.09	63.04	23.91	4.35	.....	.....
Heaters' helpers	19	190	67.9	6.32	.....	.....	.53	68.42	20.53	2.11	2.11	.....
Roll engineers	25	100	74.8	.....	.....	.....	.....	11.00	46.00	29.00	14.00	.....
Rolling crew:												
Rollers	25	73	68.5	8.22	1.37	.....	1.37	41.10	42.47	4.11	1.37	.....
Rollers' helpers	15	40	64.5	22.50	.....	.....	.....	40.00	27.50	5.00	5.00	.....
Table lever men	18	123	67.3	14.63	.....	.....	.....	30.08	55.28	.....	.....	.....
Guide setters	12	83	68.2	10.84	.....	.....	.....	30.12	45.78	7.23	6.02	.....
Roll hands, other	22	216	70.2	.....	.....	.....	4.17	49.07	43.52	1.85	1.39	.....
Hotbed men	18	106	70.0	.....	.....	.....	2.83	50.94	35.85	8.49	1.89	.....
Shearmen and saw men	27	157	69.6	3.82	.....	.....	3.82	31.21	54.78	5.10	1.27	.....
Shearmen's and saw men's helpers	18	230	69.0	1.20	.....	.....	13.48	25.65	50.87	8.70	.....	.....
Cranemen	21	103	76.9	.....	.....	.....	.....	8.74	40.78	14.56	35.92	.....
Laborers	23	699	71.3	.....	.....	.....	7.30	30.47	44.92	6.15	11.16	.....
Other occupations	.....	657	70.2	5.94	.....	.....	4.26	27.09	46.58	7.31	8.83	.....
Total, all occupations	27	2,869	70.2	3.66	.07	.10	4.57	33.98	43.64	6.80	7.18	.....

Of the principal occupations included in the above table, the cranemen customarily worked the longest hours. The average customary hours for the 103 cranemen were 76.9 per week, and more than one-third, 35.92 per cent, of them customarily worked 84 hours per week, and 91.26 per cent worked at least 72 hours per week, and none worked as few as 60 hours per week.

The 100 roll engineers averaged 74.8 hours per week; none of them worked as few as 60 hours per week, and 89 per cent worked 72 hours and over per week.

The 699 laborers averaged 71.3 hours per week; only 7.30 per cent worked as few as 60 hours per week, 62.23 per cent worked 72 hours and over, and 11.16 per cent worked 84 hours per week.

The next summary shows for each of the principal occupations the per cent of employees customarily working 72 hours and over and the per cent customarily working 84 hours.

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PER CENT OF EMPLOYEES IN THE PRINCIPAL OCCUPATIONS CUSTOMARILY WORKING 72 HOURS AND OVER PER WEEK—MISCELLANEOUS MECHANICAL MILLS.

Occupations.	Normal number of employees.	Per cent of employees whose customary working hours per week were—	
		72 and over.	84.
Heaters	92	28.26	.....
Heaters' helpers	190	24.75	2.11
Roll engineers	100	89.00	14.00
Rolling crew			
Rollers	73	47.95	1.37
Rollers' helpers	40	37.50	5.00
Table lever men	123	55.28	.....
Guide setters	83	59.03	6.02
Roll hands, other	216	46.76	1.39
Hotbed men	106	46.23	1.89
Shearmen and saw men	157	61.15	1.27
Shearmen's and saw men's helpers	230	59.57	.....
Cranemen	103	91.26	35.92
Laborers	699	62.23	11.16
Other occupations	657	62.72	8.83
Total, all occupations	2,869	57.62	7.18

The next table is a summary showing the customary working hours for employees in each of the two principal districts. In this table the time workers and the tonnage workers are shown separately for purposes of comparison.

NUMBER OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK BY PRINCIPAL DISTRICTS—MISCELLANEOUS MECHANICAL MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average hours per week.	Number of employees whose customary working hours per week were—							
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
TIME WORKERS.												
Pittsburgh	14	929	70.9	12	2	.....	32	256	435	124	68	.....
Great Lakes and Middle West	10	981	72.1	3	.....	.....	64	255	477	54	128	.....
Total, all districts	27	1,990	71.3	15	2	.....	98	572	928	179	196	.....
TONNAGE WORKERS.												
Pittsburgh	13	612	68.5	51	.....	3	.....	316	230	12	.....	.....
Great Lakes and Middle West	8	211	65.2	39	.....	.....	18	48	92	4	10	.....
Total, all districts	21	879	67.5	90	.....	3	33	403	324	16	10	.....
TIME AND TONNAGE WORKERS.												
Pittsburgh	14	1,541	69.9	63	2	3	32	572	665	136	68	.....
Great Lakes and Middle West	10	1,192	70.8	42	.....	.....	82	303	569	58	138	.....
Total, all districts	27	2,869	70.2	105	2	3	131	975	1,252	195	206	.....

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The average customary working time for the 1,990 time workers was 71.3 hours per week and the average for the 879 tonnage workers was 67.5 hours per week.

The table which follows shows for time workers and for tonnage workers combined the per cent of employees customarily working each classified number of hours per week. The totals for the two principal districts are placed in comparison.

PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK, BY PRINCIPAL DISTRICTS—MISCELLANEOUS MECHANICAL MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Pittsburgh	14	1,541	69.9	4.09	0.13	0.19	2.08	37.12	43.15	8.93	4.41	.....
Great Lakes and Middle West	10	1,192	70.8	3.52	.....	.....	6.88	25.42	47.73	4.87	11.58	.....
Total, all districts	27	2,869	70.2	3.66	.07	.10	4.57	33.98	43.64	6.80	7.18	.....

The average customary working time per week for the 2,869 employees was 70.2 hours per week; 43.64 per cent customarily worked 72 hours per week and 33.98 per cent worked over 60 and under 72 hours per week. Only 8.40 per cent of the employees worked 60 hours and under per week and 7.18 per cent worked 84 hours per week.

The percentages for the two districts varied but little, excepting that a somewhat larger proportion of the employees in the Great Lakes and Middle West district than in the Pittsburgh district worked 84 hours per week, and also a somewhat larger proportion worked 60 hours and under.

DAYS WORKED PER WEEK.

Under each occupation the customary working days or turns per week are shown for each plant in Table I, Volume II of this report. These data are briefly summarized here. The table which follows shows for each occupation the number of plants reporting, the normal number of employees, and the number of employees whose customary working time was each specified number of days or turns per week:

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NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK—MISCELLANEOUS MECHANICAL MILLS.

Occupations.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Chargers	6	31	.....	4	15	.....	12
Charging-crane and charging-machine operators	13	53	.....	14	37	.....	2
Cranemen	21	103	.....	4	47	8	44
Door operators	7	27	.....	3	24	.....	.....
Engineers, stationary	4	14	.....	.....	10	2	2
Greasers	17	52	.....	8	43	4	27
Guide setters	12	83	.....	25	53	.....	5
Heaters	19	92	1	17	67	2	5
Heaters' helpers	19	190	.....	77	105	.....	8
Hotbed men	18	106	.....	18	86	.....	2
Laborers	23	699	.....	98	441	8	152
Lever men	20	128	.....	30	84	10	4
Roll engineers	25	100	.....	6	54	28	12
Rollers	25	73	3	10	56	2	2
Rollers' helpers	15	40	.....	13	25	.....	2
Roll hands	22	216	2	12	199	.....	3
Shearmen and saw men	27	157	.....	27	124	4	2
Shearmen's and saw men's helpers	18	230	.....	61	165	4	.....
Stockers	10	59	.....	20	39	.....	.....
Table lever men	18	123	.....	12	111	.....	.....
Unclassified	21	263	.....	24	205	8	26
Total, all occupations	27	2,869	6	483	1,990	80	310

Six days or turns per week was the customary working time for 1,990, or 69.36 per cent, of the 2,869 employees, 5 and 6 days or turns for 483, or 16.84 per cent of the total, and 7 days or turns for 310, or 10.81 per cent of the total.

The table which follows shows for each of the principal occupations the per cent of employees customarily working each specified number of days or turns per week. The occupations are presented in the order of the processes of manufacture.

PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK—MISCELLANEOUS MECHANICAL MILLS.

Occupations.	Number of plants.	Normal number of employees.	Per cent of employees whose customary working time per week was				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Heaters	19	92	1.09	18.48	72.83	2.17	5.43
Heaters' helpers	19	190	.....	40.53	55.26	.....	4.21
Roll engineers	25	100	.....	6.00	54.00	28.00	12.00
Rolling crew:							
Rollers	25	73	4.11	13.70	76.71	2.74	2.74
Rollers' helpers	15	40	.....	32.50	62.50	.....	5.00
Table lever men	18	123	.....	9.76	90.24	.....	.....
Guide setters	12	83	.....	30.12	63.86	.....	6.02
Roll hands, other	22	216	.93	5.56	92.13	.....	1.39
Hotbed men	18	106	.....	16.98	81.13	.....	1.89
Shearmen and saw men	27	157	.....	17.20	78.98	2.55	1.27
Shearmen's and saw men's helpers	18	230	.....	26.52	71.74	1.74	.....
Cranemen	21	103	.....	3.88	45.63	7.77	42.72
Laborers	23	699	.....	14.02	63.09	1.14	21.75
Other occupations	.....	657	.....	15.68	69.56	3.65	11.11
Total, all occupations	27	2,869	.21	16.84	69.36	2.79	10.81

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Of the principal occupations; the cranemen show the largest proportion (42.72 per cent) working 7 days or turns per week. Laborers are next with 21.75 per cent of the 699 customarily working 7 days or turns per week. In all but two of the principal occupations some of the employees customarily worked 7 days or turns per week.

The next summary shows for the two principal districts the number and per cent of employees working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY PRINCIPAL DISTRICTS—MISCELLANEOUS MECHANICAL MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Pittsburgh	14	1,541	4	263	1,080	80	114	0.26	17.07	70.08	5.19	7.40
Great Lakes and Middle West	10	1,192	2	161	833	.....	196	.17	13.51	69.88	.....	16.44
Total, all districts	27	2,869	6	483	1,990	80	310	.21	16.84	69.36	2.79	10.81

BAR MILLS.

INTRODUCTION.

The data relative to earnings and hours of work are summarized briefly in the pages immediately following, and analyzed in more detail on pages 267 to 292.

SUMMARY OF EARNINGS AND HOURS AND DAYS OF WORK.

EARNINGS.

Data relative to earnings in bar mills were reported for 16,148 employees in special iron and steel occupations in 115 plants. The average earnings per hour for the 16,148 employees were $0.271. Over one-half of the total number of employees, 51.46 per cent, were in the Pittsburgh district, and 90.36 per cent were in the Eastern, the Pittsburgh, and the Great Lakes and Middle West districts combined. The average earnings were lowest in the Southern district and highest in the Pacific Coast district. Only 180 employees, however, were included in three plants in the latter district.

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Of the 16,148 employees included in this report on bar mills, 18.15 per cent earned 16 and under 18 cents per hour, 17.63 per cent earned 20 and under 25 cents per hour, and 11.79 per cent earned 30 and under 40 cents per hour. The per cent of employees earning each classified amount per hour both for the total of all districts and for each district separately, is shown in the following table:

PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—BAR MILLS.

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour—									
			Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 cents and over.
New England	747	$0.252	.94	2.28	24.50	18.61	4.15	14.46	13.65	9.91	2.41	9.10
Eastern	3,126	.247	5.21	9.60	16.44	9.56	9.28	16.31	10.59	10.88	5.18	6.94
Pittsburgh	8,310	.278	1.44	1.96	7.16	20.43	11.60	19.03	9.45	12.06	7.71	9.16
Great Lakes and Middle West	3,156	.280	1.39	1.11	7.07	23.42	9.70	16.86	11.09	12.33	7.16	9.88
Southern	629	.214	24.80	18.12	10.49	8.90	3.34	12.24	4.93	6.36	5.25	5.56
Pacific Coast	180	.446	.....	.....	.....	.....	.....	21.67	7.78	32.78	13.33	24.44
Total, all districts.	16,148	.271	3.03	3.90	9.79	18.15	9.98	17.63	9.99	11.79	6.84	8.90

A summary in the form of cumulative percentages which follows shows that one-sixth, 16.72 per cent, of all employees earned less than 16 cents per hour; over one-third, 34.87 per cent earned less than 18 cents per hour; and 62.48 per cent earned less than 25 cents per hour:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—BAR MILLS.

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning per hour—								
			Under 12 cents	Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	747	$0.252	.94	3.22	27.72	46.33	50.48	64.94	78.59	88.50	90.91
Eastern	3,126	.247	5.21	14.81	31.25	40.81	50.09	66.40	76.99	87.87	93.05
Pittsburgh	8,310	.278	1.44	3.40	10.56	30.99	42.59	61.62	71.07	83.13	90.84
Great Lakes and Middle West	3,156	.280	1.39	2.50	9.57	32.99	42.69	59.55	70.64	82.97	90.13
Southern	629	.214	24.80	42.92	53.41	62.31	65.65	77.89	82.82	89.18	94.43
Pacific Coast	180	.446	.....	.....	.....	.....	.....	21.67	29.45	62.23	75.56
Total, all districts	16,148	.271	3.03	6.93	16.72	34.87	44.85	62.48	72.47	84.26	91.10

The above comparison shows that the earnings were under 14 cents per hour for 42.92 per cent of the 629 employees in the Southern district, 14.81 per cent of 3,126 employees in the Eastern district, 3.40 per cent of the 8,310 employees in the Pittsburgh district, 3.22 per cent of the 747 employees in the New England district, and

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2.50 per cent of the 3,156 employees in the Great Lakes and Middle West district. None of the employees in the Pacific Coast district earned less than 14 cents per hour. The earnings were under 20 cents per hour for 65.65 per cent of the employees in the Southern district, 50.48 per cent of the employees in the New England district, 50.09 per cent of the employees in the Eastern district, 42.69 per cent of the employees in the Great Lakes and Middle West district, 42.59 per cent of the employees in the Pittsburgh district, and for none of the employees in the Pacific Coast district.

HOURS OF LABOR.

Customary working hours per week were reported for 16,146 employees in special iron and steel occupations in 115 bar mill plants, 2 employees for whom earnings were reported, but who worked 1 day only not being included. For 45.59 per cent of the employees the customary working hours were over 60 per week and for 10.76 per cent 48 hours and under.

The average customary working hours were highest in the Pittsburgh district and lowest in the Pacific Coast district, the variation being 7.3 hours per week. The hours in the Great Lakes and Middle West district were only slightly lower than in the Pittsburgh district.

The per cent of employees working each classified number of hours per week are shown for each district and for all districts in the following summary:

PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—BAR MILLS.

Districts.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—					
			48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72 and over.
New England	747	58.8	3.48	15.39	13.79	57.43	8.70	1.20
Eastern	3,126	59.6	.80	32.76	14.08	23.26	18.78	10.33
Pittsburgh	[1] 8,308	62.2	14.82	4.87	14.09	8.02	39.44	18.75
Great Lakes and Middle West	3,156	61.3	9.28	15.40	17.62	13.69	27.44	16.57
Southern	629	57.3	25.76	10.81	.64	38.47	24.32	.....
Pacific Coast	180	54.9	.....	93.33	6.67	.....	.....	.....
Total	[1] 16,146	61.1	10.76	14.03	14.16	15.46	30.65	14.94

[1] Not including 2 employees who worked 1 day only.

Seventy-two hours and over was the customary working time for 18.75 per cent of the employees in the Pittsburgh district, 16.57 per cent of the employees in the Great Lakes and Middle West district, 10.33 per cent of the employees in the Eastern district, and 1.20 per cent of the employees in the New England district; none of the employees in the Southern and Pacific Coast districts worked 72 hours and over.

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Almost one-third of the total employees in all districts, 30.65 per cent, worked over 60 and under 72 hours per week.

DAYS WORKED PER WEEK.

Six days or turns per week was the customary working time for 52.86 per cent of the total number of employees in special iron and steel occupations in 115 bar mill plants. Five and 6 days or turns, alternating, was the customary working time for 38.28 per cent of the total number of employees; 5 days or turns was the customary working time for 6.34 per cent of the total number of employees, and 7 days or turns was the customary working time for 2.27 per cent of the total number of employees.

The per cent of employees whose customary working time per week was 7 days or turns is shown by districts in the statement which follows:

PER CENT OF EMPLOYEES WHOSE CUSTOMARY WORKING TIME PER WEEK WAS 7 DAYS OR TURNS, BY DISTRICTS—BAR MILLS.

Districts.	Normal number of employees.	Per cent of employees whose customary working time per week was 7 days.	Districts.	Normal number of employees.	Per cent of employees whose customary working time per week was 7 days.
New England	747	.54	Southern	629	.....
Eastern	3,126	.58	Pacific coast	180	.....
Pittsburgh	[1] 8,308	2.86			
Great Lakes and Middle West	3,156	3.39	Total, all districts	[1] 16,146	2.27

[1] Not including 2 employees who worked 1 day only.

DESCRIPTION OF OCCUPATIONS.

In the following description of occupations the occupation name represents the term retained in the report and under which data as to wages and hours of labor are presented. The names shown in parenthesis represent the most important minor occupations included under the name used in this report, as well as other terms used in various plants to indicate the same class of work. In the first paragraph, "Duties," is given a description of the functions which employees in the occupation perform and the method by which the work is done. In the second paragraph, "Nature of work," two points are covered—first, an indication of the type of workman required for the position, and, second, the conditions under which the work is done. The occupations are presented in the order of the processes of manufacture.

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STOCKERS.

(Including Stock Unloaders; Stock Unloaders' Helpers; Steel Handlers; Stockers' Helpers; Billet Straighteners; Coal Wheelers; Coal Screeners.)

DUTIES.—Unload and handle the pieces of steel (billets) for the heating furnaces. The billets are usually stacked in piles in the yard, each pile representing a separate size and character of steel, which is indicated by marks on each billet. The billets are taken from these piles or from the cars in which they are received and loaded on barrows or trucks, which are pushed to the furnaces. In the most modern plants this occupation is largely eliminated by the use of magnet cranes and low trucks operated electrically or by narrow-gauge locomotives or by the use of roller conveyors. The stockers also handle the coal for the furnaces if they use solid fuel.

NATURE OF WORK.—Heavy, varying considerably both in character and in severity and performed by unskilled workmen. The rates paid in the same plant are roughly proportional to the amount of physical work done. There is considerable danger of minor injuries from the falling of the billets as they are removed from the stock piles.

CHARGERS.

DUTIES.—Put the iron or steel billets into the heating furnace as directed by the heater. A large part of the charging is done by hand, the billet being laid on the flat end of a long iron tool known as a "peel," which is pushed into the furnace and the billet laid at the proper point. In many of the newer plants, however, the billets are pushed into the furnace by mechanical pushers, which are controlled by levers. Many of the charging-machine operators are undoubtedly included here, being designated simply as "chargers," but the attempt was made to separate them as far as possible. In a number of establishments the heaters' helpers charge the furnaces.

NATURE OF WORK.—Where the charging is done by hand, the work is heavy, demanding very little skill and comparatively little experience. The work is intermittent in character, but during the actual charging the men are exposed to great heat. Where machines are used, the work is, of course, light, but the machine operator is constantly exposed to considerable heat.

HEATERS.

DUTIES.—In charge of one or more heating furnaces; see that proper stock is charged; that the proper temperature is maintained; and is otherwise generally responsible for the proper working of a furnace and for minor repairs to the lining.

NATURE OF WORK.—A very important and responsible position, requiring considerable practical knowledge of the heat treatment of

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metals, which can be gained only by long experience. The heater probably has more to do with the successful operation of a mill than any other employee. The work is largely supervisory and carries with it very little manual labor.

HEATERS' HELPERS.

DUTIES.—The duties of the heaters' helpers vary entirely with the character of the furnace or mill and with the division of work in the various plants. In some plants the heaters' helpers perform all the duties connected with heating the steel and delivering it to the rolls. That is, they fire the furnace, clean the grates, and tap the cinder, repair the furnace bottoms, charge and draw the steel, and carry it with tongs down to the rolls. The firing of the furnace and the cleaning of the grates is eliminated from the list of duties either by the use of a gas-fired furnace, which is very common, or by the employment of a furnace fireman, as shown below, as is the tapping of the cinder by a cinder man. The charging of the steel is eliminated by the employment of separate chargers, described above, or by the use of charging machines or continuous furnaces, while the drawing and delivery of the steel to the rolls is almost always eliminated by the employment of drag downs or the use of some form of mechanical conveyor in connection with a charging machine.

NATURE OF WORK.—The character and skill required by the work vary widely, ranging from that of a first helper, who takes charge of the operation of a furnace, to that of an unskilled laborer, who wheels out cinder. The conditions under which the work is done vary greatly, the employees in the well-equipped plants being protected from the heat, while those in plants where badly built furnaces are close together are exposed to considerable heat almost all the time.

CINDER MEN.

DUTIES.—Taps out the cinder which collects in the bottom of the furnace. As this cinder contains a high percentage of metal it is cast into blocks, which can be used in the open-hearth or blast furnaces.

NATURE OF WORK.—Performed by unskilled workmen with little experience. The heat is not great and the work is not heavy.

FIREMEN, FURNACE.

DUTIES.—Keep up the fires and clean the grates of coal-fired furnaces. The designation also includes a few men who simply watch the fires in gas-fired furnaces when the mill is not operated.

NATURE OF WORK.—Unskilled, hot work, very closely analogous to that of the ordinary stationary fireman.

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DOOR OPERATORS.

(Including Door Boys; Pull Ups.)

DUTIES.—Operate levers or pull chains by which the furnace doors are raised and lowered. For a more complete description see same occupation, page 183.

NATURE OF WORK.—Positions are ordinarily filled by boys, as the work is light.

DRAG DOWNS.

(Including Transfer Men; Telegraphers; Buggy Men; Run Downs; Bear Downs.)

DUTIES.—Draw and carry the steel from the furnace to the rolls, except where mechanical conveyors are used. The steel is drawn by grasping it with a pair of tongs and pulling it out of the furnace, and is then carried to the rolls either by simply dragging or sliding it along the steel floor, or, if the piece be heavy, the tongs may be supported by a chain from an overhead trolley (telegraph) and carried down without touching the floor. If the piece be very heavy, it is put into a small iron buggy and wheeled down to the rolls.

NATURE OF WORK.—Heavy, hot work, varying, of course, both in severity and in exposure to heat with the size of the billets used and the speed at which the mill is operated. No great skill is required, but considerable dexterity, acquired only through experience, is necessary in order to handle the material with facility. The drag downs are nearly always relieved in summer by spell hands, and in some plants the use of spell hands is continued the year round.

ROLL ENGINEERS.

DUTIES.—Operate the engines which drive the rolls and see that they are kept in proper condition. All engines used in these mills are nonreversing.

NATURE OF WORK.—Work is entirely analogous to that of an ordinary stationary engineer.

ROLLERS.

DUTIES.—Are in charge of and responsible for the operation of the rolls. The duties consist chiefly in seeing that the proper rolls are installed, that they are properly set and kept in good condition, and that the rolling crew performs every part of its work properly. He also directs and takes part in the changing of the rolls, and when there is a "cobble" or any other difficulty he works with the crew in getting the mill going properly. In case the steel is not properly heated he notifies the heater and directs what he wants done.

NATURE OF WORK.—Very responsible position in which a thorough practical knowledge of the properties of steel is indispensable. When

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everything is going properly he has little to do, but when there is a change of orders or rolls, or when there is a breakdown or other stoppage of the mill, he is very busy directing and doing what is necessary.

ROUGHERS.

DUTIES.—Pass the steel back and forth through the first stand of rolls. The rougher down takes the billet from the drag down, grasping it near the end with a pair of specially shaped tongs. The other end is thrust between the lower set of rolls, where it is gripped and drawn through by the revolving rolls. As it comes from the rolls on the other side it is grasped with a similar set of tongs by the rougher up, frequently known as the catcher, who, in a "three-high" mill, puts it between the center and upper rolls, which carry it back under pressure to the rougher down. In "two-high" mills, of which few remain, the piece is put on top of the upper roll and is thus carried back without being worked to the rougher down. This process is repeated until the piece has been considerably elongated and reduced in cross section. The passes in the roughing rolls are diamond shaped, the piece being given a quarter turn each time to bring the pressure of the rolls on a new part.

NATURE OF WORK.—Heavy, hot work, requiring considerable experience if the steel is to be handled properly and with facility. It is hard to describe the difficulty of handling a heavy, red-hot piece of steel and putting it into the rolls properly. A rather long period of training in other positions is necessary before a man is able to work at the roughing rolls. The difficulty and severity of the work increases generally with the size of the piece handled and the speed of the mill.

CATCHERS.

DUTIES.—This term is used to cover both the position of the rougher up and also the work on any of the intermediate sets of rolls. To avoid any error in classifying the catchers, therefore, they have been carried as a separate group, although the wages indicate that the larger number are actually roughers. The work is the same as that of the roughers or of the stranders.

NATURE OF WORK.—Same as that of roughers or of stranders.

STRANDERS.

(Including Stick Ins.)

DUTIES.—When the piece comes from the roughing rolls it is grasped with tongs by the strander and the end put into the proper pass, which is usually oval shaped. If the piece is to make more than one pass through the rolls, it is allowed to run out along the floor and the rear end is grasped by tongs and put into the pass

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between the upper pair of rolls. If it makes only one pass through the stands of strand rolls, it is grasped by the forward end as it issues from the rolls and looped around to enter the rolls of the next stand.

NATURE OF WORK.—The work of the strander is lighter than that of the rougher, as the piece is by this time greatly reduced in section; but it requires a great deal of dexterity to handle the rapidly lengthening piece of steel and to enter it in the proper passes.

FINISHERS.

DUTIES.—Handle the steel at the last or finishing pass. In rolling bars the piece is usually run out to the floor and lies there for a moment in order to allow the scale to form, so that the finishing rolls will remove it.

NATURE OF WORK.—The work is lighter, but the amount of skill and dexterity required depends entirely on the size of the product and the speed of the rolls. If very small material is being rolled and the finishing rolls are geared up to several hundred revolutions per minute, great skill and quickness are necessary to grasp the rapidly moving piece at the proper point and return it to the proper pass.

HOOK UPS.

(Including Hook Men; Hookers; Hooks.)

DUTIES.—The rougher on mills with rolls 10 inches or more in diameter and on the larger mills the catchers and finishers are almost always assisted by hook ups. The hook up derives his name from the long bar, with a hook on one end and a handle on the other, suspended by a chain at a point nearer the hook than the handle, which is used in his work. The hook is placed underneath the billet and the whole acts as a lever, with the chain as a fulcrum to raise the billet.

NATURE OF WORK.—This work is very heavy and hot, but demands by no means as highly skilled workmen as the positions already described. A considerable amount of skill is required in handling heavy pieces, but in general the wages vary almost directly with the amount of physical work done.

ROLL HANDS.

(Including Rougher's Helpers; Bar Men; Edgers; Roller's Helpers; Roll Spell Hands; Guiders; Pass Men; Planishers; Pony Roughers; Shove Ups; Screw Men; Spanner Men.)

DUTIES.—Includes a miscellaneous collection of occupations around the rolls, which have been held under this designation in order that the rolling crew as a whole may be assembled. Some of the workers in these positions are highly skilled, due to the nature of

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the work required either by the special type of mill used or by the special character of the product. The majority of the separate occupations included are comparatively unimportant, the work in some of them being performed by boys. In a number of plants the larger part of the rolling crew was reported simply as "roll hands," which have been included here. The latter class includes most of the employees in this classification reported as receiving high rates.

HOTBED MEN.

(Including Dragouts; Hotbed Lever Men; Gripmen; Hot Straighteners.)

DUTIES.—In the greater number of bar mills the piece as it comes from the finishing rolls is grasped by the drag out with a pair of tongs and dragged off down the steel floor to the perforated plates which constitute the hotbed. The piece is straightened either by being laid out at full length or, if a more perfect straightening is needed, by putting the two ends in grips which pull away from each other, thus effectually stretching the piece out perfectly straight; or, if the bar is large, wooden mallets are use to maul out any bends. In the most modern mills the piece is carried out by roller or cone conveyors to an inclined automatic hotbed, the piece rolling down the incline as the fingers which hold it in place are lowered. In this case men are required only to operate levers and to straighten out any piece that is bent.

NATURE OF WORK.—The work of the drag outs and the hot straighteners on the older mills, which, however, are by far the greater in number, is hot and varies in difficulty and severity with the size of the product rolled. In the most modern mills the hotbed man is simply a lever man and needs little skill or experience to perform his work.

SHEARMEN AND SAW MEN.

DUTIES.—Operate the shears or saws by which the finished material is cut to proper lengths. As the work consists chiefly in pulling a lever, no matter what kind of shears or saws are used, no further description is necessary.

NATURE OF WORK.—The work varies in character according to how nearly the material has to be sheared or sawed to a given size. Much of the shearing is simply cutting bars up into scrap, and requires no skill or experience.

SHEARMEN'S AND SAW MEN'S HELPERS.

(Including Scrap Men.)

DUTIES.—Assist in handling the material at the shears or saws and clean up the scrap which accumulates.

NATURE OF WORK.—Chiefly light work, demanding only unskilled workmen.

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BUNDLERS.

DUTIES.—Assemble the sheared bars into bundles and bind them with wire for shipment. The work is usually done in direct connection with the shearing or sawing, and is very frequently a part of the duties of the shearman's helpers.

NATURE OF WORK.—Light work, demanding only unskilled workmen.

CRANEMEN.

DUTIES.—Operate the few small cranes used in bar mills.

NATURE OF WORK.—Chiefly low-grade cranemen.

GREASERS.

DUTIES.—Grease the roll necks and the gears and rollers for the conveyors if any are used.

NATURE OF WORK.—Low-grade work, requiring little skill or experience.

LABORERS.

(Including Roll Scale Men.)

DUTIES.—Clean up the mill and do the many light jobs around the mill. This class probably includes a number who should be classed as stockers.

NATURE OF WORK.—Chiefly light, not exposed to any special hazard, and requiring only unskilled workmen.

UNCLASSIFIED.

(Including Controllers; Conveyor Men; Dummy Boys; Cold Straighteners; Inspectors; Chasers, etc.)

DUTIES.—Includes a number of minor positions not in the rolling crew required by local conditions as well as a number of classes which embraced several occupations and could not be classed with any one.

NATURE OF WORK.—Varies widely in character. This group includes all the boys who were not specifically reported as having one of the definite occupations described above.

EARNINGS AND HOURS AND DAYS OF WORK, BY OCCUPATIONS.

EARNINGS PER HOUR.

Data relative to earnings per hour for each occupation and each plant are shown in detail in Table I, Volume II, and for each occupation and each district in Table II. Table I shows for each plant separately customary number of working days per week, customary number of working hours per day, normal number of employees, average earnings per hour, and number of employees earning each classified amount per hour. Table II shows for each occupation and each district the number of plants reporting data, the number of employees

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included, and the average earnings per hour. The table is so arranged that a comparison is easily made of the earnings of time workers and of tonnage workers in the different occupations within each of the districts and also of the earnings of each of the two classes of workers in the several districts.

The tables here presented summarize the information concerning earnings. The table which follows is a summary of Table II with the exception that time and tonnage workers are not shown separately but are combined.

AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY DISTRICTS—BAR MILLS.

Occupations.	New England district.	Eastern district.	Pittsburgh district.	Great Lakes and Middle West district.	Southern district.	Pacific Coast district.	Total, all districts.
Bundlers:							
Plants	.....	3	17	1	2	.....	23
Employees	.....	27	441	20	10	.....	498
Average earnings per hour, cents	.....	19.2	18.9	16.7	14.3	.....	18.7
Catchers, 8-inch:							
Plants	.....	5	5	.....	2	.....	12
Employees	.....	6	17	.....	4	.....	27
Average earnings per hour, cents	.....	25.8	40.6	.....	17.6	.....	34.2
Catchers, 9-inch:							
Plants	.....	3	5	1	1	.....	10
Employees	.....	9	19	4	2	.....	34
Average earnings per hour, cents	.....	28.2	39.7	31.2	27.7	.....	35.5
Catchers, 10-inch:							
Plants	2	4	12	2	.....	1	21
Employees	3	12	42	10	.....	2	69
Average earnings per hour, cents	25.9	24.6	38.5	32.8	.....	36.8	34.6
Catchers, 12-inch:							
Plants	1	8	7	1	.....	.....	17
Employees	2	20	21	2	.....	.....	45
Average earnings per hour, cents	25.0	28.0	46.8	45.6	.....	.....	38.6
Catchers, 14-inch:							
Plants	.....	1	4	.....	.....	.....	5
Employees	.....	2	14	.....	.....	.....	16
Average earnings per hour, cents	.....	34.8	34.3	.....	.....	.....	34.4
Catchers, 16-inch:							
Plants	1	6	4	4	2	2	19
Employees	2	11	14	11	4	3	45
Average earnings per hour, cents	31.1	38.4	53.7	40.5	41.1	58.7	45.5
Catchers, 18-inch:							
Plants	.....	4	6	3	.....	.....	13
Employees	.....	6	15	8	.....	.....	29
Average earnings per hour, cents	.....	33.8	53.8	54.0	.....	.....	49.8
Catchers, 20-inch:							
Plants	.....	2	5	.....	.....	1	8
Employees	.....	8	17	.....	.....	1	26
Average earnings per hour, cents	.....	33.6	49.0	.....	.....	52.9	43.6
Catchers, not specified:							
Plants	2	11	13	9	1	.....	36
Employees	4	49	45	30	2	.....	130
Average earnings per hour, cents	34.1	31.0	42.0	39.8	28.0	.....	37.3
Chargers:							
Plants	2	7	28	11	2	2	52
Employees	9	31	362	73	14	7	496
Average earnings per hour, cents	15.5	20.8	20.0	21.3	15.8	30.6	20.2

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AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY DISTRICTS—BAR MILLS—Continued.

Occupations.	New England district.	Eastern district.	Pittsburgh district.	Great Lakes and Middle West district.	Southern district.	Pacific Coast district.	Total, all districts.
Cinder men:							
Plants	.....	3	11	9	3	2	28
Employees	.....	17	47	64	7	11	146
Average earnings per hour, cents	.....	15.6	17.4	18.8	12.2	23.9	18.0
Cranemen:							
Plants	.....	2	9	2	.....	.....	13
Employees	.....	7	39	18	.....	.....	64
Average earnings per hour, cents	.....	16.8	18.5	20.1	.....	.....	18.8
Door operators:							
Plants	.....	9	12	6	1	.....	28
Employees	.....	41	45	48	3	.....	137
Average earnings per hour, cents	.....	12.9	13.5	14.6	8.5	.....	13.6
Drag downs:							
Plants	1	16	31	14	5	2	69
Employees	8	80	234	91	23	7	443
Average earnings per hour, cents	17.5	22.6	27.4	32.5	21.7	30.2	27.4
Finishers, 8-inch:							
Plants	1	1	11	.....	3	.....	16
Employees	4	1	44	.....	6	.....	55
Average earnings per hour, cents	16.5	30.2	27.9	.....	23.9	.....	26.9
Finishers, 9-inch:							
Plants	1	2	7	1	1	2	14
Employees	1	5	17	1	2	2	28
Average earnings per hour, cents	12.0	29.0	29.6	12.5	15.8	37.0	28.0
Finishers, 10-inch:							
Plants	.....	6	14	1	1	.....	22
Employees	.....	8	45	2	2	.....	57
Average earnings per hour, cents	.....	31.0	33.5	27.5	33.3	.....	33.0
Finishers, 12-inch:							
Plants	.....	1	8	1	.....	.....	10
Employees	.....	1	19	2	.....	.....	22
Average earnings per hour, cents	.....	33.8	32.5	29.1	.....	.....	32.2
Finishers, 14-inch:							
Plants	.....	1	3	.....	.....	.....	4
Employees	.....	2	8	.....	.....	.....	10
Average earnings per hour, cents	.....	22.5	40.2	.....	.....	.....	36.1
Finishers, 16-inch:							
Plants	.....	1	3	1	2	.....	7
Employees	.....	3	12	3	5	.....	23
Average earnings per hour, cents	.....	27.5	32.6	40.0	30.9	.....	32.3
Finishers, 18-inch:							
Plants	.....	1	4	2	.....	.....	7
Employees	.....	1	9	5	.....	.....	15
Average earnings per hour, cents	.....	30.9	48.9	29.6	.....	.....	41.7
Finishers, 20-inch:							
Plants	.....	2	3	.....	.....	.....	5
Employees	.....	5	5	.....	.....	.....	10
Average earnings per hour, cents	.....	38.6	35.3	.....	.....	.....	37.3
Finishers, not specified:							
Plants	1	2	12	12	.....	.....	27
Employees	1	5	27	43	.....	.....	76
Average earnings per hour, cents	17.5	30.5	37.0	31.4	.....	.....	33.2
Firemen, furnace:							
Plants	.....	4	10	10	1	.....	25
Employees	.....	13	63	52	4	.....	132
Average earnings per hour cents	.....	18.6	23.4	21.4	27.8	.....	22.2
Greasers:							
Plants	1	1	7	2	.....	.....	11
Employees	2	2	2	14	.....	.....	40
Average earnings per hour, cents	22.6	15.0	17.1	17.4	.....	.....	17.3

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AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY DISTRICTS—BAR MILLS—Continued.

Occupations.	New England district.	Eastern district.	Pittsburgh district.	Great Lakes and Middle West district.	Southern district.	Pacific Coast district.	Total, all districts.
Heaters:							
Plants	9	35	37	25	6	3	115
Employees	59	187	338	168	31	12	795
Average earnings per hour, cents	46.6	49.8	59.0	60.9	53.8	102.2	56.9
Heaters' helpers:							
Plants	8	33	33	18	3	2	97
Employees	62	281	445	108	28	18	937
Average earnings per hour, cents	25.5	25.3	27.9	26.0	22.5	39.[illegible]	26.8
Hook ups, 8-inch:							
Plants	.....	2	2	.....	.....	.....	4
Employees	.....	3	8	.....	.....	.....	11
Average earnings per hour, cents	.....	19.3	17.2	.....	.....	.....	17.6
Hook ups, 9-inch:							
Plants	.....	1	1	.....	1	.....	3
Employees	.....	2	12	.....	2	.....	16
Average earnings per hour, cents	.....	17.5	30.7	.....	15.8	.....	27.6
Hook ups, 10-inch:							
Plants	.....	5	11	.....	.....	.....	16
Employees	.....	9	38	.....	.....	.....	47
Average earnings per hour cents	.....	18.0	24.8	.....	.....	.....	23.7
Hook ups, 12-inch:							
Plants	.....	8	10	3	.....	.....	21
Employees	.....	20	60	16	.....	.....	96
Average earnings per hour, cents	.....	23.9	24.4	23.9	.....	.....	24.2
Hook ups, 14-inch:							
Plants	1	2	3	.....	.....	.....	6
Employees	4	6	21	.....	.....	.....	31
Average earnings per hour, cents	20.0	22.0	28.9	.....	.....	.....	26.1
Hook ups, 16-inch:							
Plants	1	6	6	5	2	2	22
Employees	2	21	31	19	10	8	91
Average earnings per hour, cents	19.0	23.7	33.3	29.2	22.4	35.6	29.2
Hook ups, 18-inch:							
Plants	.....	5	6	3	.....	.....	14
Employees	.....	13	50	16	.....	.....	79
Average earnings per hour, cents	.....	19.2	26.5	29.8	.....	.....	26.2
Hook ups, 20-inch:							
Plants	.....	3	5	1	.....	1	10
Employees	.....	33	68	4	.....	2	107
Average earnings per hour cents	.....	34.6	29.0	34.1	.....	32.1	31.3
Hook ups, not specified:							
Plants	3	9	16	15	1	.....	44
Employees	18	42	107	111	2	.....	280
Average earnings per hour, cents	17.7	20.4	28.1	29.1	18.1	.....	26.8
Hotbed men:							
Plants	6	29	33	22	3	3	96
Employees	79	308	626	254	32	16	1,315
Average earnings per hour, cents	16.2	19.8	20.8	19.7	17.7	34.8	20.2
Laborers:							
Plants	8	22	30	20	2	1	83
Employees	140	599	968	503	136	20	2,356
Average earnings per hour, cents	15.0	13.9	16.1	16.3	11.4	22.2	15.4
Roll engineers:							
Plants	5	21	24	14	3	1	68
Employees	14	62	169	43	11	3	302
Average earnings per hour, cents	27.0	20.2	23.2	25.2	18.5	37.5	23.1
Rollers, 8-inch:							
Plants	1	5	14	2	3	.....	2.
Employees	4	6	50	4	6	.....	70
Average earnings per hour, cents	74.6	6.6	105.8	48.7	87.[illegible]	.....	96.8
Rollers, 9-inch:							
Plants	4	5	10	4	2	2	27
Employees	13	12	24	9	3	2	63
Average earnings per hour, cents	74.1	68.4	7.[illegible]	56.8	90.8	150.9	97.9

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AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY DISTRICTS—BAR MILLS—Continued.

Occupations.	New England district.	Eastern district.	Pittsburgh district.	Great Lakes and Middle West district.	Southern district.	Pacific Coast district.	Total, all districts.
Rollers, 10-inch:							
Plants	3	9	18	4	1	1	36
Employees	4	15	47	7	2	2	77
Average earnings per hour, cents	66.1	77.9	116.6	167.3	115.5	96.5	111.2
Rollers, 12-inch:							
Plants	3	10	10	4	.....	.....	27
Employees	4	15	22	7	.....	.....	48
Average earnings per hour, cents	92.9	72.8	99.1	111.3	.....	.....	92.7
Rollers, 14-inch:							
Plants	1	2	5	.....	.....	.....	8
Employees	1	4	10	.....	.....	.....	15
Average earnings per hour, cents	70.0	72.3	91.8	.....	.....	.....	84.7
Rollers, 16-inch:							
Plants	2	8	7	4	3	2	26
Employees	4	14	12	9	5	3	47
Average earnings per hour, cents	57.9	62.5	122.8	87.8	91.5	116.6	90.1
Rollers, 18-inch:							
Plants	.....	5	6	3	.....	.....	14
Employees	.....	7	10	8	.....	.....	25
Average earnings per hour, cents	.....	58.6	102.1	74.1	.....	.....	81.2
Rollers, 20-inch:							
Plants	.....	2	3	1	.....	1	7
Employees	.....	2	8	1	.....	1	12
Average earnings per hour, cents	.....	69.5	109.0	125.4	.....	79.1	104.0
Rollers, not specified:							
Plants	2	10	19	16	1	.....	48
Employees	4	27	46	49	1	.....	127
Average earnings per hour, cents	80.2	86.0	100.2	82.7	141.0	.....	90.2
Roll hands, 8-inch:							
Plants	.....	2	11	.....	2	.....	15
Employees	.....	3	58	.....	6	.....	67
Average earnings per hour cents	.....	23.7	28.0	.....	17.4	.....	26.9
Roll hands, 9-inch:							
Plants	.....	2	6	1	2	2	13
Employees	.....	4	29	2	10	4	49
Average earnings per hour, cents	.....	20.6	27.7	17.3	19.9	34.9	25.7
Roll hands, 10-inch:							
Plants	2	1	14	3	1	.....	21
Employees	7	1	110	8	2	.....	128
Average earnings per hour, cents	20.0	38.9	37.6	31.2	32.6	.....	36.3
Roll hands, 12-inch:							
Plants	3	2	7	2	.....	.....	14
Employees	9	10	21	17	.....	.....	57
Average earnings per hour, cents	23.6	21.8	31.3	27.8	.....	.....	27.3
Roll hands, 14-inch:							
Plants	.....	.....	2	.....	.....	.....	2
Employees	.....	.....	13	.....	.....	.....	13
Average earnings per hour, cents	.....	.....	47.2	.....	.....	.....	47.2
Roll hands, 16-inch:							
Plants	2	4	4	1	.....	.....	11
Employees	6	10	29	12	.....	.....	57
Average earnings per hour, cents	21.8	24.7	30.9	24.1	.....	.....	27.5
Roll hands, 18-inch:							
Plants	.....	5	5	.....	.....	.....	10
Employees	.....	16	23	.....	.....	.....	39
Average earnings per hour, cents	.....	20.5	24.0	.....	.....	.....	22.4
Roll hands, 20-inch:							
Plants	.....	1	3	.....	.....	.....	4
Employees	.....	13	11	.....	.....	.....	24
Average earnings per hour, cents	.....	32.7	32.3	.....	.....	.....	32.6

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AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY DISTRICTS—BAR MILLS—Continued.

Occupations.	New England district.	Eastern district.	Pittsburgh district.	Great Lakes and Middle West district.	Southern district.	Pacific Coast district.	Total, all districts.
Roll hands, not specified:							
Plants	3	5	14	10	.....	.....	32
Employees	8	14	74	45	.....	.....	141
Average earnings per hour, cents	22.4	30.8	31.8	30.4	.....	.....	30.8
Roughers, 8-inch:							
Plants	1	5	15	2	3	.....	26
Employees	8	13	155	12	18	.....	206
Average earnings per hour, cents	46.0	32.8	39.0	32.7	36.8	.....	38.5
Roughers, 9-inch:							
Plants	4	5	11	4	2	2	28
Employees	44	26	70	26	10	6	182
Average earnings per hour, cents	30.7	37.0	43.1	45.5	40.8	67.6	40.6
Roughers, 10-inch:							
Plants	3	9	16	4	1	1	34
Employees	10	44	111	25	4	4	198
Average earnings per hour, cents	27.3	32.0	40.2	45.7	46.9	48.6	36.9
Roughers, 12-inch:							
Plants	3	9	11	4	.....	.....	27
Employees	16	42	70	30	.....	.....	158
Average earnings per hour, cents	25.5	37.7	43.6	31.9	.....	.....	38.4
Roughers, 14-inch:							
Plants	1	2	4	.....	.....	.....	7
Employees	8	12	24	.....	.....	.....	44
Average earnings per hour, cents	25.0	40.5	40.7	.....	.....	.....	37.8
Roughers, 16-inch:							
Plants	2	8	6	5	3	2	26
Employees	8	34	29	24	10	7	112
Average earnings per hour, cents	29.4	29.7	51.7	40.2	44.2	68.8	41.8
Roughers, 18-inch:							
Plants	.....	6	6	2	.....	.....	14
Employees	.....	23	31	12	.....	.....	66
Average earnings per hour, cents	.....	37.4	49.8	53.2	.....	.....	46.3
Roughers, 20-inch:							
Plants	.....	3	5	1	.....	1	10
Employees	.....	11	24	8	.....	2	45
Average earnings per hour, cents	.....	45.7	54.5	50.2	.....	56.6	51.2
Roughers, not specified:							
Plants	4	11	18	16	.....	.....	49
Employees	31	72	114	141	.....	.....	358
Average earnings per hour, cents	30.3	41.9	42.1	43.4	.....	.....	41.6
Shearmen and saw men:							
Plants	5	26	34	21	6	3	95
Employees	16	209	413	148	23	13	822
Average earnings per hour, cents	20.1	19.1	25.8	28.0	19.1	31.4	24.5
Shearmen's and saw men's helpers:							
Plants	2	15	29	15	5	3	69
Employees	16	95	792	197	49	18	1,167
Average earnings per hour, cents	16.2	14.6	19.5	17.5	14.7	25.4	18.7
Stockers:							
Plants	3	16	21	14	3	.....	57
Employees	15	181	476	204	40	.....	916
Average earnings per hour, cents	17.1	20.7	20.6	20.5	14.3	.....	20.2
Stranders, 8-inch:							
Plants	.....	5	12	2	3	.....	22
Employees	.....	7	135	8	10	.....	160
Average earnings per hour, cents	.....	20.8	23.5	23.8	17.9	.....	23.2
Stranders, 9-inch:							
Plants	2	4	10	4	1	2	23
Employees	32	18	48	16	2	4	120
Average earnings per hour, cents	16.7	21.4	23.0	28.5	22.9	42.2	22.5

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AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY DISTRICTS—BAR MILLS—Concluded.

Occupations.	New England district.	Eastern district.	Pittsburgh district.	Great Lakes and Middle West district.	Southern district.	Pacific Coast district.	Total, all districts.
Stranders, 10-inch:							
Plants	1	6	14	3	1	1	26
Employees	3	20	111	18	2	2	156
Average earnings per hour, cents	15.0	21.0	36.6	32.4	37.7	36.8	33.5
Stranders, 12-inch:							
Plants	.....	6	4	1	.....	.....	11
Employees	.....	20	30	20	.....	.....	70
Average earnings per hour, cents	.....	23.4	28.3	30.6	.....	.....	27.8
Stranders, 14-inch:							
Plants	.....	2	2	.....	.....	.....	4
Employees	.....	14	8	.....	.....	.....	22
Average earnings per hour, cents	.....	25.5	23.4	.....	.....	.....	24.8
Stranders, 16-inch:							
Plants	.....	1	3	.....	.....	.....	4
Employees	.....	2	7	.....	.....	.....	9
Average earnings per hour cents	.....	40.0	36.6	.....	.....	.....	37.5
Stranders, not specified:							
Plants	1	7	11	10	.....	.....	29
Employees	20	21	71	133	.....	.....	245
Average earnings per hour, cents	17.6	21.1	25.3	30.6	.....	.....	27.2
Unclassified:							
Plants	7	22	24	22	4	.....	79
Employees	42	131	414	218	86	.....	891
Average earnings per hour, cents	18.2	15.8	18.1	19.3	14.0	.....	17.8

In the above table the employees are entered in 78 separate occupations, the rolling crews being separated not only in accordance with the particular occupation in which they were engaged, but also with relation to the size of the mill in which they were employed. This minute subdivision was necessary, it will be shown later, because of the wide variation in the relative earnings of the same occupation in the larger and smaller mills. No separation has, however, been made for the mills of different sizes except in the case of the rolling crews, the duties and relative amounts earned in the other occupations being very little influenced by the size of the mill. Although this table is too complex and detailed to permit the complete analysis which will be based on the other tables, some interesting conclusions may be drawn from it. With few exceptions, in the 27 occupations for which data were reported in the Pacific Coast district, that district shows the highest level of earnings, in most cases being very much higher than the other districts. It should be remembered, however, that the total number of employees in the three plants reported for this district is only 180, a little more than 1 per cent of the total number of employees throughout the United States. Leaving this district out of consideration, therefore, and comparing simply the earnings in the other five districts which are represented by a fairly large number

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of employees, the situation is as follows: The New England district, which was represented by 747 employees, showed the highest average earnings in three of the occupation classifications; the Eastern district, in which 3,126 employees, or 19.36 per cent of the total, were reported, showed the highest average earnings in 11 of the occupation classifications; the Pittsburgh district, in which 8,310, or 51.46 per cent of the total employees were reported, showed the highest average rate in 37 of the occupation classifications; the Great Lakes and Middle West district, which was represented by 3,156, or 19.54 per cent of the total employees, showed the highest average wage in 22 of the 78 occupation classifications; the Southern district, reporting 629 employees, or 3.90 per cent of the total, had the highest average earnings per hour in 5 of the 78 classifications.

Before passing on to a more detailed study of occupations, a similarly complete table comparing the earnings of time workers and of tonnage workers follows:

COMPARISON OF AVERAGE EARNINGS PER HOUR OF TIME WORKERS AND OF TONNAGE WORKERS, BY OCCUPATIONS—BAR MILLS.

Occupations.	Time.			Tonnage.			Time and tonnage combined.		
	Number of plants.	Number of employees.	Average rate per hour.	Number of plants.	Number of employees.	Average rate per hour.	Number of plants.	Number of employees.	Average rate per hour.
Bundlers	22	418	$0.180	7	80	$0.224	23	498	$0.187
Catchers:									
8-inch	1	2	.211	11	25	.354	12	27	.342
9-inch	2	7	.230	8	27	.380	10	34	.355
10-inch	4	17	.298	17	52	.360	21	69	.346
12-inch	2	6	.205	15	39	.409	17	45	.386
14-inch	3	11	.288	2	5	.446	5	16	.344
16-inch	4	9	.476	15	36	.451	19	45	.455
18-inch	1	1	.283	12	28	.506	13	29	.498
20-inch	1	7	.394	7	19	.448	8	26	.436
Not specified	5	12	.302	31	118	.379	36	130	.373
Chargers	33	319	.179	30	177	.245	52	496	.202
Cinder men	24	114	.173	6	32	.210	28	146	.180
Cranemen	13	63	.188	1	1	.221	13	64	.188
Door operators	25	123	.134	4	14	.163	28	137	.136
Drag downs	24	116	.214	52	327	.293	69	443	.274
Finishers:									
8-inch	5	18	.233	12	37	.286	16	55	.269
9-inch	6	10	.250	8	18	.298	14	28	.280
10-inch	9	16	.295	13	41	.342	22	57	.330
12-inch	5	10	.305	5	12	.335	10	22	.322
14-inch	3	7	.298	1	3	.501	4	10	.361
16-inch	4	12	.327	3	11	.320	7	23	.323
18-inch	2	3	.274	5	12	.463	7	15	.417
20-inch	2	3	.357	3	7	.377	5	10	.373
Not specified	11	35	.275	16	41	.381	27	76	.332
Firemen, furnace	20	74	.198	9	58	.253	25	132	.222
Greasers	11	46	.173	.....	.....	.....	11	46	.173
Heaters	33	117	.425	89	678	.594	115	795	.569
Heaters' helpers	47	320	.219	66	617	.292	97	937	.268
Hook ups:									
8-inch	3	10	.170	1	1	.263	4	11	.176
9-inch	.....	.....	.....	3	16	.276	3	16	.276
10-inch	5	9	.175	11	38	.249	16	47	.237
12-inch	5	22	.211	16	74	.251	21	96	.242
14-inch	4	17	.196	2	14	.338	6	31	.261
16-inch	7	16	.243	17	75	.300	22	91	.292
18-inch	4	30	.198	12	49	.310	14	79	.262
20-inch	4	37	.237	8	70	.340	10	107	.313
Not specified	15	71	.200	33	209	.291	44	280	.268

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COMPARISON OF AVERAGE EARNINGS PER HOUR OF TIME WORKERS AND OF TONNAGE WORKERS, BY OCCUPATIONS—BAR MILLS—Concluded.

Occupations.	Time.			Tonnage.			Time and tonnage combined.		
	Number of plants.	Number of employees.	Average rate per hour.	Number of plants.	Number of employees.	Average rate per hour.	Number of plants	Number of employees.	Average rate per hour.
Hotbed men	53	462	.179	67	853	.214	96	1,315	$0.202
Laborers	83	2,356	.154	.....	.....	.....	83	2,356	.154
Roll engineers	65	292	.231	3	10	.222	68	302	.231
Rollers:									
8-inch	1	1	.636	25	69	.973	25	70	.968
9-inch	6	10	.760	22	53	.899	27	63	.879
10-inch	10	15	.844	30	62	1.168	36	77	1.112
12-inch	6	7	.596	22	41	.974	27	48	.927
14-inch	6	10	.761	2	5	1.012	8	15	.847
16-inch	8	13	.864	18	34	.912	26	47	.901
18-inch	1	1	.922	13	24	.807	14	25	.812
20-inch	1	4	.857	6	8	1.119	7	12	1.040
Not specified	14	30	.878	37	97	.910	48	127	.902
Roll hands:									
8-inch	9	21	.215	9	46	.294	15	67	.269
9-inch	7	14	.188	8	35	.286	13	49	.257
10-inch	9	43	.243	16	85	.417	21	128	.363
12-inch	7	20	.227	7	37	.293	14	57	.272
14-inch	1	1	.270	1	12	.500	2	13	.472
16-inch	6	26	.230	6	31	.296	11	57	.275
18-inch	5	21	.227	7	18	.221	10	39	.224
20-inch	2	9	.326	2	15	.325	4	24	.326
Not specified	17	54	.220	18	87	.364	32	141	.308
Roughers:									
8-inch	1	4	.297	25	202	.386	26	206	.385
9-inch	6	26	.304	22	156	.421	28	182	.406
10-inch	10	37	.288	25	161	.409	34	198	.389
12-inch	6	26	.269	21	132	.401	27	158	.384
14-inch	5	26	.278	2	18	.512	7	44	.378
16-inch	7	32	.336	19	80	.445	26	112	.418
18-inch	1	1	.288	13	65	.465	14	66	.463
20-inch	1	4	.474	9	41	.515	10	45	.512
Not specified	11	54	.321	39	304	.433	49	358	.416
Shearmen and sawmen	75	504	.211	49	318	.302	95	822	.245
Shearmen's and sawmen's helpers	58	864	.175	22	303	.222	69	1,167	.187
Stockers	44	536	.176	24	380	.243	57	916	.202
Stranders:									
8-inch	8	35	.171	15	125	.247	22	160	.232
9-inch	7	32	.197	16	88	.234	23	120	.225
10-inch	4	17	.208	22	139	.351	26	156	.335
12-inch	3	22	.203	8	48	.315	11	70	.278
14-inch	3	16	.220	1	6	.314	4	22	.248
16-inch	3	7	.294	1	2	.536	4	9	.375
Not specified	9	66	.201	21	179	.299	29	245	.272
Unclassified	67	686	.164	30	205	.227	79	891	.178

In almost every case the earnings of tonnage workers are very much higher than in the case of time workers, there being but six cases in which time workers received a higher average rate than the tonnage workers, and in only one of these cases, that of roll engineers, was there any considerable number of employees reported. Both time workers and tonnage workers were reported in all but three of the 78 occupation classifications, there being no tonnage workers reported for greasers and laborers, and no time workers reported in the case of hook ups on 9-inch mills. A large difference between the earnings of time workers and of tonnage workers is particularly noticeable in those occupations in which a large number of persons are employed, as, for example, heaters, of whom 795 were reported for

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115 plants. The earnings for time workers in this occupation were 42.5 cents and for tonnage workers 59.7 cents, or approximately 40 per cent higher than for the time workers. Similarly, in the case of heaters' helpers, of whom 937 were employed, the earnings of the tonnage workers were 33.33 per cent higher than those of the time workers. For hotbed men, of whom 1,315 were reported, the earnings of tonnage workers were 19.55 per cent higher, and for stockers, of whom 916 were reported, the earnings of tonnage workers were 38.07 per cent higher.

In order to permit of a more simple comparison of the separate occupations the table which follows has been prepared. In this table only the most important occupations have been retained, although all occupations are included in the total and no attention has been paid to the size of the mill in the case of rolling crews. In addition to the average earnings per hour, the columns at the right of the table show the per cent of employees in each occupation who earn each classified amount per hour. The occupations are given in the order of the processes of manufacture.

PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS—BAR MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Stockers	57	916	$0.202	1.97	4.37	3.17	26.64	25.55	23.80	5.90	6.00	2.62	.....	.....	.....
Chargers	52	496	.202	1.61	2.22	6.45	22.78	26.01	21.98	13.71	4.64	.....	0.60	.....	.....
Heaters	115	795	.569	.....	.....	.....	.....	.....	.....	5.91	13.46	19.37	25.16	18.11	17.99
Heaters' helpers	96	937	.268	.....	.21	5.44	7.90	4.06	26.68	24.23	24.87	5.76	.64	.....	.21
Drag downs	69	443	.274	.90	2.26	2.93	5.42	9.26	32.28	14.00	23.25	7.90	.90	.....	.90
Roll engineers	68	302	.231	.....	.66	2.65	5.30	7.28	52.65	24.83	5.63	.99	.....	.....	.....
Rolling crews:															
Rollers	106	484	.943	.....	.....	.....	.....	.....	.....	.41	2.27	5.17	10.12	12.60	69.42
Roughers	107	1,369	.406	.....	.....	.....	.....	.15	4.89	14.10	31.04	28.85	14.76	5.55	.66
Catchers	83	421	.386	.24	.....	.24	2.14	1.43	8.79	19.24	29.45	23.28	9.26	3.80	2.14
Stranders	77	782	.269	.90	1.41	2.05	13.30	8.31	28.39	11.89	23.27	6.52	3.96	.....	.....
Finishers	60	296	.320	.68	.68	2.03	2.03	1.01	14.53	27.70	29.39	14.86	4.73	2.36	.....
Hook ups	94	758	.269	.....	1.06	2.24	7.78	16.62	22.96	13.59	27.18	7.26	1.06	.26	.....
Roll hands, other	71	575	.290	1.04	1.91	3.48	4.17	7.13	22.26	16.70	22.26	12.87	6.61	.87	.70
Hotbed men	96	1,315	.202	4.56	5.48	13.76	18.40	14.14	23.88	14.14	3.65	1.52	.46	.....	.....
Shearmen and sawmen	95	822	.245	.....	.97	7.79	10.46	14.23	37.35	12.53	8.15	6.33	.73	.....	1.46
Shearmen's and sawmen's helpers	69	1,167	.187	2.06	3.86	9.25	37.36	16.80	22.62	4.97	3.08	.....	.....	.....	.....
Bundlers	23	498	.187	.40	.40	27.31	24.70	17.47	23.49	3.82	2.41	.....	.....	.....	.....
Laborers	83	2,356	.154	7.34	12.39	32.17	46.05	1.19	.85	.....	.....	.....	.....	.....	.....
Other occupations	.....	1,416	.184	13.06	7.98	9.96	20.20	20.55	19.42	4.52	2.82	1.48	.....	.....	.....
Total, all occupations	115	16,148	.271	3.03	3.90	9.80	18.15	9.98	17.63	9.99	11.79	6.84	3.76	1.93	3.21

It will be noticed in the above table that with the exception of heaters, all the more highly paid occupations were in the rolling crew.

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The employees in bar mills may be separated into two principal groups, the heating crew of which the heater, a highly skilled and responsible workman, is virtually the foreman, and the rolling crew of which the roller is the foreman. These two occupations show the highest average earnings as well as the highest range of any occupations in the bar mills.

For heaters, the average earnings were 56.9 per hour, none being reported who earned less than 25 cents per hour. More than 60 per cent earned between 40 and 70 cents per hour. A large proportion, approximately 18 per cent, earned 70 cents or more per hour. The earnings of the rollers were even higher, the average earnings per hour being 94.3 cents. None were reported as earning less than 25 cents per hour, and 69.42 per cent earned 70 cents or more per hour. In view of the very high earnings of this class of employees, a somewhat more detailed analysis of those earning more than 70 cents per hour is proper; 9.30 per cent earned 80 and under 90 cents per hour; 12.60 per cent earned 90 cents and under $1 per hour; 13.43 per cent earned $1 and under $1.25, and 19.42 per cent or approximately one-fifth of the whole number, earned $1.25 or more per hour. It must be remembered, however, in considering these high earnings, that the roller, and, to a less degree the heater, is not a workman in the ordinary sense in which that term is understood. His duties, as has been explained in the detailed description of occupations, are largely supervisory, and it is only in the case of emergencies that it is necessary for him to do any considerable amount of manual labor. The remaining members of the rolling crew are, however, workmen in the ordinary sense, and a comparison of their earnings is of considerable interest. The highest paid occupation for the rolling crew next to that of roller is that of rougher, whose average hourly earnings are 40.6 cents, and of this class approximately 60 per cent earned 30 and under 50 cents per hour. The catcher, whose duties are almost exactly the same as those of the rougher, receives approximately the same average earnings per hour.

Considering, finally, the laborers, of whom 2,356 were reported and all of whom were unskilled workmen, the average earnings for this class were 15.4 cents per hour. Approximately 98 per cent of the total received less than 18 cents per hour. The largest single group of laborers, including 46.05 per cent of the total, received 16 and under 18 cents per hour. The next largest group, 32.17 per cent, were reported as earning 14 and under 16 cents per hour. In order to compare the earnings of the various members of the rolling

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crews in the mills of different sizes, the following table showing simply the average earnings per hour has been prepared:

AVERAGE EARNINGS PER HOUR OF MEMBERS OF ROLLING CREWS—BAR MILLS.

Occupations.	Size of mills.								
	8-inch.	9-inch.	10-inch.	12-inch.	14-inch.	16-inch.	18-inch.	20-inch.	Other.
Rollers	$0.968	$0.879	$1.112	$0.927	$0.847	$0.901	$0.812	$1.040	$0.902
Roughers	.385	.406	.389	.384	.378	.418	.463	.512	.416
Catchers	.342	.355	.346	.386	.344	.455	.498	.436	.373
Stranders	.232	.225	.335	.278	.248	.375	.....	.....	.272
Finishers	.269	.280	.330	.322	.361	.323	.417	.373	.332
Hook ups	.176	.276	.237	.242	.261	.292	.262	.313	.268
Roll hands, other	.269	.257	.363	.272	.472	.275	.224	.326	.308

It will be noticed in studying this table that for all occupations except rollers there is a decided and fairly regular advance in the average earnings per hour as the size of the mill and the weight of the product increases. Although this increase is very noticeable in the case of roughers, catchers, stranders, and finishers, it is particularly noticeable in the case of hook ups. This rather marked difference arises from the fact that hook ups are not highly skilled employees, but are required to do a great deal of very heavy work, which increases in severity with the increase in the size of the mill. On the 20-inch mill, for example, the weight of the material handled is several times that in the smaller 10-inch and 12-inch mills and a higher rate is accordingly paid for this increased exertion. For the other employees, although the exertion increases with the size of the mill, skill and experience are such large factors that the increase in wages is by no means proportionate to the increase in size. In the case of rollers, it will be noticed there is no connection between the size of the mill and the average earnings per hour. This is due entirely to the fact, which has been mentioned above, that very little physical exertion is ordinarily demanded of a roller, his earnings being based almost entirely on his skill and experience. Since the knowledge necessary for the successful operation of an 8-inch mill is as great as that required for an 18 or 20 inch mill, no regular differences between the rates in these or any of the other sizes of mills are to be found. Whatever difference does exist is due entirely to the skill and experience of the particular roller and to the custom of the individual establishment in which he is employed.

In the table which follows, the complete data for the rolling crews on each of the different sizes of mills are presented. This table furnishes the basis upon which a most complete study of these occupations may be made.

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NUMBER OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS, BY SIZE OF MILL AND BY OCCUPATION—BAR MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average earnings per hour.	Number of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
ROLLING CREWS.															
Eight-inch mill:															
Rollers	25	70	$0.968	.....	.....	.....	.....	.....	.....	.....	.....	8	9	9	44
Roughers	26	206	.385	.....	.....	.....	.....	.....	12	44	64	52	22	12	.....
Catchers	12	27	.342	1	.....	1	1	.....	5	4	8	7	.....	.....	.....
Stranders	22	160	.232	3	7	3	34	8	53	35	15	2	.....	.....	.....
Finishers	16	55	.269	.....	.....	4	3	1	16	11	18	2	.....	.....	.....
Hook ups	4	11	.176	.....	.....	4	2	4	.....	1	.....	.....	.....	.....	.....
Roll hands, other	15	67	.269	2	10	4	5	3	10	10	10	10	3	.....	.....
Nine-inch mill:															
Rollers	27	63	.379	.....	.....	.....	.....	.....	.....	.....	3	3	3	9	45
Roughers	28	182	.406	.....	.....	.....	.....	.....	7	24	67	40	38	4	2
Catchers	10	34	.355	.....	.....	.....	3	.....	5	4	10	8	4	.....	.....
Stranders	23	120	.225	.....	3	6	32	12	40	4	20	3	.....	.....	.....
Finishers	14	28	.280	.....	2	2	2	.....	5	6	4	7	.....	.....	.....
Hook ups	3	16	.276	.....	.....	2	2	.....	.....	.....	12	.....	.....	.....	.....
Roll hands, other	13	49	.257	4	.....	6	7	.....	11	1	10	10	.....	.....	.....
Ten-inch mill:															
Rollers	36	77	1.112	.....	.....	.....	.....	.....	.....	.....	.....	3	4	4	66
Roughers	34	198	.389	.....	.....	.....	.....	.....	4	30	68	77	19	.....	.....
Catchers	21	69	.346	.....	.....	.....	2	.....	9	19	14	25	.....	.....	.....
Stranders	26	156	.335	.....	1	3	10	6	22	24	47	22	21	.....	.....
Finishers	22	57	.330	.....	.....	.....	.....	.....	4	18	27	6	2	.....	.....
Hook ups	16	47	.237	.....	.....	5	5	9	7	14	7	.....	.....	.....	.....
Roll hands, other	21	128	.363	.....	1	3	3	.....	30	16	25	25	20	3	2
Twelve-inch mill:															
Rollers	27	48	.927	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	10	31
Roughers	27	158	.384	.....	.....	.....	.....	.....	5	43	48	41	7	14	.....
Catchers	17	45	.386	.....	.....	.....	3	.....	3	12	8	9	10	.....	.....
Stranders	11	70	.278	.....	.....	.....	1	4	30	10	17	.....	8	.....	.....
Finishers	10	22	.322	.....	.....	.....	.....	.....	2	6	9	5	.....	.....	.....
Hook ups	21	96	.242	.....	.....	1	2	8	41	42	2	.....	.....	.....	.....
Roll hands, other	14	57	.272	.....	.....	.....	.....	12	15	16	12	.....	.....	.....	2
Fourteen-inch mill:															
Rollers	8	15	.847	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	4	9
Roughers	7	44	.373	.....	.....	.....	.....	.....	.....	20	5	9	10	.....	.....
Catchers	5	16	.344	.....	.....	.....	.....	.....	1	6	5	.....	4	.....	.....
Stranders	4	22	.248	.....	.....	.....	.....	3	13	.....	6	.....	.....	.....	.....
Finishers	4	10	.361	.....	.....	.....	.....	.....	2	3	1	.....	4	.....	.....
Hook ups	6	31	.261	.....	.....	.....	.....	9	12	.....	10	.....	.....	.....	.....
Roll hands, other	2	13	.472	.....	.....	.....	.....	.....	.....	1	.....	.....	12	.....	.....
Sixteen-inch mill:															
Rollers	26	47	.901	.....	.....	.....	.....	.....	.....	1	1	3	6	6	30
Roughers	26	112	.418	.....	.....	.....	.....	.....	17	6	38	24	17	8	2
Catchers	19	45	.455	.....	.....	.....	.....	2	2	4	12	9	7	4	5
Stranders	4	9	.375	.....	.....	.....	.....	.....	4	1	.....	2	2	.....	.....
Finishers	7	23	.323	.....	.....	.....	.....	2	2	6	7	5	.....	1	.....
Hook ups	22	91	.292	.....	4	.....	6	16	9	6	44	2	2	2	.....
Roll hands, other	11	57	.275	.....	.....	1	4	1	15	26	8	1	1	.....	.....
Eighteen-inch mill:															
Rollers	14	25	.812	.....	.....	.....	.....	.....	.....	.....	3	.....	8	.....	14
Roughers	14	66	.463	.....	.....	.....	.....	.....	6	3	8	26	15	8	.....
Catchers	13	29	.498	.....	.....	.....	.....	2	.....	1	2	13	5	4	2
Stranders	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Finishers	7	15	.417	.....	.....	.....	.....	.....	.....	5	4	2	.....	4	.....
Hook ups	14	79	.262	.....	2	4	8	13	22	3	21	6	.....	.....	.....
Roll hands, other	10	39	.224	.....	.....	.....	.....	13	22	.....	4	.....	.....	.....	.....
Twenty-inch mill:															
Rollers	7	12	1.040	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	11
Roughers	10	45	.512	.....	.....	.....	.....	.....	.....	1	3	15	18	7	1
Catchers	8	26	.436	.....	.....	.....	.....	.....	2	2	8	6	2	6	.....
Stranders	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Finishers	5	10	.373	.....	.....	.....	.....	.....	.....	3	2	4	1	.....	.....
Hook ups	10	107	.313	.....	2	.....	2	8	22	3	57	13	.....	.....	.....
Roll hands, other	4	24	.326	.....	.....	.....	.....	.....	4	4	15	1	.....	.....	.....

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NUMBER OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS, BY SIZE OF MILL AND BY OCCUPATION—BAR MILLS—Concluded.

Occupations.	Number of plants.	Normal number of employees.	Average earnings per hour.	Number of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Other mills:															
Rollers	48	127	.902	.....	.....	.....	.....	.....	.....	1	4	6	11	19	86
Roughers	49	358	.416	.....	.....	.....	.....	2	16	22	124	111	56	23	4
Catchers	36	130	.373	.....	.....	.....	.....	2	10	29	57	21	7	2	2
Stranders	29	245	.272	4	.....	4	27	32	60	19	77	22	.....	.....	.....
Finishers	27	76	.332	2	.....	.....	1	.....	12	24	15	13	7	2	.....
Hook ups	44	280	.268	.....	.....	1	32	59	61	34	53	34	6	.....	.....
Roll hands, other	32	141	.308	.....	.....	6	5	12	21	22	44	27	2	2	.....

The next summary shows for each district the number of plants reporting normal number of employees, average earnings per hour, and number of employees earning each classified amount per hour. Time workers and tonnage workers are shown separately and the two classes are also combined.

NUMBER OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, AND AVERAGE HOURLY EARNINGS BY DISTRICTS—BAR MILLS.

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Number of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
TIME WORKERS.															
New England	9	468	$0.205	.....	8	140	99	22	90	77	19	2	7	1	3
Eastern	32	1,373	.164	154	262	449	203	80	127	54	26	8	3	4	3
Pittsburgh	37	4,752	.198	65	126	527	1,609	804	999	309	176	50	21	13	53
Great Lakes and Middle West	20	1,456	.190	32	29	214	652	214	196	65	24	11	2	7	10
Southern	6	373	.138	136	101	51	31	5	42	5	2	.....	.....	.....	.....
Pacific Coast	3	91	.387	.....	.....	.....	.....	.....	33	12	25	11	.....	.....	10
Total, all districts	107	8,513	.192	387	526	1,381	2,594	1,125	1,487	522	272	82	33	25	79
TONNAGE WORKERS.															
New England	5	279	.331	7	9	43	40	9	18	25	55	16	23	12	22
Eastern	29	1,753	.313	9	38	65	96	210	383	277	314	154	78	62	67
Pittsburgh	31	3,558	.385	55	37	68	89	160	582	476	826	591	318	136	220
Great Lakes and Middle West	23	1,700	.362	12	6	9	87	92	336	285	365	215	131	67	95
Southern	6	256	.331	20	13	15	25	16	35	26	38	33	9	5	21
Pacific Coast	2	89	.505	.....	.....	.....	.....	.....	6	2	34	13	15	4	15
Total, all districts	96	7,635	.362	103	103	200	337	487	1,360	1,091	1,632	1,022	574	286	440
TIME AND TONNAGE WORKERS.															
New England	9	747	.252	7	17	183	139	31	108	102	74	18	30	13	25
Eastern	35	3,126	.247	163	300	514	299	290	510	331	340	162	81	66	70
Pittsburgh	37	8,310	.278	120	163	595	1,698	964	1,581	785	1,002	641	339	149	273
Great Lakes and Middle West	25	3,156	.280	44	35	223	739	306	532	350	389	226	133	74	105
Southern	6	629	.214	156	114	66	56	21	77	31	40	33	9	5	21
Pacific Coast	3	180	.446	.....	.....	.....	.....	.....	39	14	59	24	15	4	25
Total, all districts	115	16,148	.271	490	629	1,581	2,931	1,612	2,847	1,613	1,904	1,104	607	311	519

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The average hourly earnings for 16,148 employees was 27.1 cents. The average earnings for the 8,513 employees paid on a time basis was 19.2 cents and for the 7,635 paid on a tonnage basis, 36.2 cents per hour, or 88.54 per cent higher than the rate for time workers. This marked difference between the earnings per hour is due in part to the fact that the proportion of tonnage workers in the skilled is much greater than in the unskilled occupations, but, as has been noted on a preceding page, even in the same occupations the tonnage workers regularly receive higher average earnings than do the time workers. The lowest reported rate was under 10 cents per hour and the highest $1.25 or more per hour, there being in each of these classes 117 employees. Only 5.14 per cent of all employees, however, receive 60 cents or more per hour. The most striking characteristic of earnings in bar mills when compared with the earnings in other mills is the extreme regularity with which earnings under 50 cents per hour are distributed. This is due in large part to the fact that a relatively smaller number of unskilled employees can be utilized in bar mills than in the other mills in the industry.

The table which follows shows the per cent of employees earning each classified amount per hour. These percentages are computed from the third section of the table immediately preceding in which time and tonnage workers are combined.

PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, AND AVERAGE HOURLY EARNINGS, BY DISTRICTS—BAR MILLS.

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
New England	9	747	$0.252	.94	2.28	24.50	18.61	4.15	14.46	13.65	9.91	2.41	4.02	1.74	3.35
Eastern	35	3,126	.247	5.21	9.60	16.44	9.56	9.28	16.31	10.59	10.88	5.18	2.59	2.11	2.24
Pittsburgh	37	8,310	.278	1.44	1.96	7.16	20.43	11.60	19.03	9.45	12.06	7.71	4.08	1.79	3.29
Great Lakes and Middle West	25	3,156	.280	1.39	1.11	7.07	23.42	9.70	16.86	11.09	12.33	7.16	4.21	2.34	3.33
Southern	6	629	.214	24.80	18.12	10.49	8.90	3.34	12.24	4.93	6.36	5.25	1.43	.79	3.34
Pacific coast	3	180	.446	.....	.....	.....	.....	.....	21.67	7.78	32.78	13.33	8.33	2.22	13.89
Total, all districts	115	16,148	.271	3.03	3.90	9.79	18.15	9.98	17.63	9.99	11.79	6.84	3.76	1.93	3.21

It will be noticed from the above table that while there is a regular progression up to the predominant rate of 16 and under 18 cents per hour, there is, with a few variations, a gradual decline in the proportionate numbers in the following columns for the total of all districts. This does not apply in the same way to separate districts, although there is comparatively little difference between the average earnings per hour in the districts reporting the largest number of employees. The second largest group earned 20 and under 25 cents

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per hour, and third largest group, including 11.79 of the total employees, earned 30 and under 40 cents per hour.

The summary in the form of cumulative percentages which follows shows that 16.72 per cent of all employees earned less than 16 cents per hour, 34.87 per cent earned less than 18 cents per hour, and 72.47 per cent earned less than 30 cents per hour.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR—BAR MILLS.

Earnings per hour.	Number of employees.	Per cent of total number of employees.	Earnings per hour.	Number of employees.	Per cent of total number of employees.
Under 12 cents	490	3.03	Under 25 cents	10,090	62.48
Under 14 cents	1,119	6.93	Under 30 cents	11,703	72.47
Under 16 cents	2,700	16.72	Under 40 cents	13,607	84.26
Under 18 cents	5,631	34.87	Under 50 cents	14,711	91.10
Under 20 cents	7,243	44.85			

The per cent of employees in each of the districts earning each classified amount per hour is shown by means of cumulative percentages in the table which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—BAR MILLS.

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning per hour—								
			Under 12 cts.	Under 14 cts.	Under 16 cts.	Under 18 cts.	Under 20 cts.	Under 25 cts.	Under 30 cts.	Under 40 cts.	Under 50 cts.
New England	747	$0.252	0.94	3.22	27.72	46.33	50.48	64.94	78.59	88.50	90.91
Eastern	3,126	.247	5.21	14.81	31.25	40.81	50.09	66.40	76.99	87.87	93.05
Pittsburgh	8,310	.278	1.44	3.40	10.56	30.99	42.59	61.62	71.07	83.13	90.84
Great Lakes and Middle West	3,156	.280	1.39	2.50	9.57	32.99	42.69	59.55	70.64	82.97	90.13
Southern	629	.214	24.80	42.92	53.41	62.31	65.65	77.89	82.82	89.18	94.43
Pacific Coast	180	.446	.....	.....	.....	.....	.....	21.67	29.45	62.23	75.56
Total, all districts	16,118	.271	3.03	6.93	16.72	34.87	44.85	62.48	72.47	84.26	91.10

Although over one-half of the total number of employees were in the Pittsburgh district, there were a sufficient number in each of the other districts to permit of a comparison of the relative earnings. Considering only average earnings per hour, the Pacific Coast district reported by far the highest average, 44.6 cents per hour. The second highest is shown for the Great Lakes and Middle West district, with the average for the Pittsburgh district only a very little lower. The average for the New England district, which is the next highest, was 2.6 cents lower than the Pittsburgh district, and 0.5 of a cent higher than the Eastern district, for which the average is 24.7 cents per hour. The lowest average earnings per hour were reported for the Southern district, 21.4 cents per hour, which is 3.3 cents lower than the Eastern

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district and 6.4 cents lower than the average for the Pittsburgh district. It may be noted also that the relation between the districts shown by the average earnings per hour is generally true also for the per cent earning less than each specified amount. There are some slight exceptions to this rule, however, which may be noted. For example, although the Great Lakes and Middle West district reports a higher average earning than the Pittsburgh district, it nevertheless shows a slightly greater proportion earning less than 18 cents per hour than the Pittsburgh district, this being balanced by the fact that there is a slightly greater proportion of employees at the higher rates in the Great Lakes and Middle West district. It is interesting also to note that the differences between the various districts are much less in the case of the more highly paid employees than in the case of the unskilled workmen at the lower rates. This arises in part, no doubt, from the fact that employees earning the higher rates pass from one district to another with comparative freedom, and in a general sense the employees in these more highly paid occupations may be considered as competing throughout the country as a whole, whereas the competition of the unskilled employees is largely limited to the particular district in which they happen to be.

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working hours per week are presented in detail for each occupation and each plant in Table I, Volume II, of this report. These data are summarized in the text tables which follow. The first of these tables shows for each occupation the number of plants reporting, the normal number of employees, the average customary hours per week, and the number of employees whose customary working time was each classified number of hours per week:

NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, AND AVERAGE HOURS WORKED PER WEEK—BAR MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Bundlers	23	498	62.8	2	14	146	53	223	60	.....	.....	.....
Catchers:												
8-inch	12	27	57.1	8	3	7	.....	9	.....	.....	.....	.....
9-inch	10	34	54.2	7	11	10	6	.....	.....	.....	.....	.....
10-inch	21	69	56.3	19	19	10	.....	16	5	.....	.....	.....
12-inch	17	45	61.1	3	10	10	2	16	4	.....	.....	.....
14-inch	5	16	49.9	13	1	.....	.....	2	.....	.....	.....	.....
16-inch	19	45	56.1	8	15	8	.....	14	.....	.....	.....	.....
18-inch	13	29	57.0	6	3	11	2	7	.....	.....	.....	.....
20-inch	8	26	57.6	7	7	4	.....	2	6	.....	.....	.....
Not specified	36	130	57.7	18	36	24	14	28	10	.....	.....	.....
Chargers	52	496	64.0	33	32	67	26	260	78	.....	.....	.....
Cinder men	28	146	60.7	13	26	38	3	53	13	.....	.....	.....
Cranemen	13	64	70.1	.....	.....	10	2	19	18	6	7	2
Door operators	28	127	62.4	10	12	34	13	46	21	1	.....	.....
Drag downs	69	443	60.3	64	71	79	33	131	65	.....	.....	.....

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NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, AND AVERAGE HOURS WORKED PER WEEK—BAR MILLS—Concluded.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Finishers:												
8-inch	16	55	59.6	12	6	.....	8	21	8	.....	.....	.....
9-inch	14	28	58.0	5	7	4	5	4	3	.....	.....	.....
10-inch	22	57	60.3	10	6	2	4	25	10	.....	.....	.....
12-inch	10	22	60.3	5	3	2	.....	8	4	.....	.....	.....
14-inch	4	10	51.2	6	2	.....	2	.....	.....	.....	.....	.....
16-inch	7	23	59.3	2	4	7	.....	10	.....	.....	.....	.....
18-inch	7	15	58.1	3	1	5	.....	6	.....	.....	.....	.....
20-inch	5	10	64.0	1	3	.....	.....	2	4	.....	.....	.....
Not specified	27	76	62.8	9	12	2	5	34	14	.....	.....	.....
Firemen, furnace	25	132	63.0	19	7	21	13	41	23	.....	8	.....
Greasers	11	46	71.7	.....	.....	.....	3	5	30	6	2	.....
Heaters	115	795	59.1	114	146	170	65	230	65	.....	5	.....
Heaters' helpers	96	937	59.6	145	180	116	93	288	110	.....	5	.....
Hook ups:												
8-inch	4	11	64.5	.....	2	1	.....	8	.....	.....	.....	.....
9-inch	3	16	49.8	9	4	3	.....	.....	.....	.....	.....	.....
10-inch	16	47	61.8	9	7	1	4	12	14	.....	.....	.....
12-inch	21	96	59.8	24	9	14	2	33	14	.....	.....	.....
14-inch	6	31	51.6	19	6	.....	2	4	.....	.....	.....	.....
16-inch	22	91	59.0	8	25	16	.....	42	.....	.....	.....	.....
18-inch	14	79	61.4	5	3	32	4	35	.....	.....	.....	.....
20-inch	10	107	64.2	8	24	10	.....	27	38	.....	.....	.....
Not specified	44	280	60.8	54	25	28	41	78	54	.....	.....	.....
Hotbed men	96	1,315	61.1	156	201	165	140	405	230	18	.....	.....
Laborers	83	[1] 2,354	62.9	.....	321	263	859	437	348	44	72	10
Roll engineers	68	302	68.5	6	18	8	39	85	96	18	28	4
Rollers:												
8-inch	25	70	59.9	12	9	11	7	21	10	.....	.....	.....
9-inch	27	63	57.3	10	19	7	16	6	3	.....	2	.....
10-inch	36	77	58.4	16	14	12	4	21	10	.....	.....	.....
12-inch	27	48	60.7	4	8	10	5	16	5	.....	.....	.....
14-inch	8	15	53.3	8	2	.....	2	2	1	.....	.....	.....
16-inch	26	47	57.6	6	14	10	2	13	2	.....	.....	.....
18-inch	14	25	56.6	6	3	8	2	5	1	.....	.....	.....
20-inch	7	12	56.6	4	2	2	.....	3	1	.....	.....	.....
Not specified	48	127	59.6	22	22	16	17	38	10	.....	2	.....
Roll hands:												
8-inch	15	67	63.9	7	2	4	7	29	18	.....	.....	.....
9-inch	13	49	58.0	5	5	15	16	6	2	.....	.....	.....
10-inch	21	128	59.6	19	38	11	5	25	30	.....	.....	.....
12-inch	14	57	58.2	12	4	19	3	19	.....	.....	.....	.....
14-inch	2	13	49.8	12	.....	.....	.....	.....	1	.....	.....	.....
16-inch	11	57	61.3	3	15	6	3	18	12	.....	.....	.....
18-inch	10	39	61.6	.....	8	10	2	16	3	.....	.....	.....
20-inch	4	24	63.6	7	.....	.....	.....	2	15	.....	.....	.....
Not specified	32	141	63.8	12	4	20	16	48	41	.....	.....	.....
Roughers:												
8-inch	26	206	59.5	44	21	18	26	67	30	.....	.....	.....
9-inch	28	182	56.8	26	46	40	48	12	10	.....	.....	.....
10-inch	34	198	58.6	42	35	34	17	36	34	.....	.....	.....
12-inch	27	158	61.7	10	29	36	8	46	29	.....	.....	.....
14-inch	7	44	52.9	22	10	.....	6	6	.....	.....	.....	.....
16-inch	26	112	58.3	8	28	38	6	32	.....	.....	.....	.....
18-inch	14	66	58.3	9	7	25	6	19	.....	.....	.....	.....
20-inch	10	45	63.1	4	10	8	.....	5	18	.....	.....	.....
Not specified	49	358	59.2	64	45	47	52	117	33	.....	.....	.....
Shearmen and saw men	95	822	61.2	66	101	157	125	275	87	7	4	.....
Shearmen's and saw men's helpers	69	1,167	62.6	103	86	88	171	558	130	25	6	.....
Stockers	57	916	59.4	109	150	130	218	236	73	.....	.....	.....
Stranders:												
8-inch	22	160	62.3	14	8	25	18	79	16	.....	.....	.....
9-inch	23	120	58.0	10	29	21	44	12	4	.....	.....	.....
10-inch	26	156	57.1	49	16	25	3	38	25	.....	.....	.....
12-inch	11	70	61.1	.....	16	20	2	32	.....	.....	.....	.....
14-inch	4	22	55.9	8	.....	.....	8	6	.....	.....	.....	.....
16-inch	4	9	58.1	.....	2	7	.....	.....	.....	.....	.....	.....
Not specified	29	245	58.6	41	42	15	48	85	14	.....	.....	.....
Unclassified	79	891	62.0	103	134	63	140	333	92	16	10	.....
Total, all occupations	115	[1] 16,146	61.1	1,737	2,266	2,286	2,496	4,948	2,105	141	151	16

[1] Not including 2 employees who worked 1 day only.

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The table which follows shows for each of the principal occupations the per cent of employees customarily working each classified number of hours per week. The occupations are given in the order of the processes of manufacture:

PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, AND AVERAGE HOURS WORKED PER WEEK—BAR MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Stockers	57	916	59.4	11.90	16.38	14.19	23.80	25.76	7.97	.....	.....	.....
Chargers	52	496	64.0	6.65	6.45	13.51	5.24	52.42	15.73	.....	.....	.....
Heaters	118	795	59.1	14.34	18.36	21.38	8.18	28.93	8.18	.....	0.63	.....
Heaters' helpers	96	937	59.6	15.47	19.21	12.39	9.93	30.74	11.74	.....	.53	.....
Drag downs	69	443	60.3	14.45	16.03	17.83	7.45	29.57	14.67	.....	.....	.....
Roll engineers	68	302	68.5	1.99	5.96	2.65	12.91	28.15	31.79	5.96	9.27	1.32
Rolling crews:												
Rollers	106	484	58.6	18.18	19.21	15.70	11.36	25.83	8.88	.....	.83	.....
Roughers	107	1,369	58.9	16.73	16.87	17.97	12.34	24.84	11.25	.....	.....	.....
Catchers	83	421	57.0	21.14	24.94	19.95	5.70	22.33	5.94	.....	.....	.....
Stranders	77	782	59.1	15.60	14.45	14.45	15.73	32.23	7.54	.....	.....	.....
Finishers	60	296	60.2	17.91	14.86	7.43	8.11	37.16	14.53	.....	.....	.....
Hook ups	94	758	60.5	17.94	13.85	13.85	6.99	31.53	15.83	.....	.....	.....
Roll hands, other	71	575	61.1	13.39	13.22	14.78	9.04	28.35	21.22	.....	.....	.....
Hotbed men	96	1,315	61.1	11.86	15.29	12.55	10.65	30.80	17.49	1.37	.....	.....
Shearmen and saw men	95	822	61.2	8.03	12.29	19.10	15.21	33.45	10.58	.85	.49	.....
Shearmen's and saw men's helpers	69	1,167	62.6	8.83	7.37	7.54	14.65	47.81	11.14	2.14	.51	.....
Bundlers	23	498	62.8	.40	2.81	29.32	10.64	44.78	12.05	.....	.....	.....
Laborers	83	[1] 2,354	62.8	.....	13.64	11.17	36.49	18.56	14.78	1.87	3.06	.42
Other occupations	.....	1,416	62.7	10.24	12.64	11.72	12.29	35.10	13.91	2.05	1.91	.14
Total, all occupations	115	[1] 16,146	61.1	10.76	14.03	14.16	15.46	30.65	13.04	.87	.94	.10

[1] Not including 2 employees who worked 1 day only.

The above table shows for the different occupations a fairly equal distribution of employees under the different classifications of hours of work. There are, however, some rather striking exceptions to this statement, as in the case of chargers, who show an unusually large proportion working more than 60 hours per week. This is largely to be accounted for by the fact that this class of employees necessarily begin work before the actual time of starting the mill. Similarly, the roll engineers show a large proportion working more than 60 hours per week. This extra time for the engineers is required by the fact that they utilize the time when the mill is not in operation to give their engines a thorough overhauling. The various occupations included under the rolling crew work approximately the same hours, the difference that exists being explained by the fact that all the occupations do not appear in each of the mills, and it is only a matter of chance that the mills in which catchers, for example, are

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reported have a shorter number of working hours per week than the mills in which stranders were reported.

In order to bring out the relation which exists between the occupation and the number of hours worked per week in simpler and more easily understood form, the following table has been prepared. This table shows the per cent of employees customarily working 72 hours and over per week, and also the per cent of employees customarily working 84 hours and over per week.

PER CENT OF EMPLOYEES IN THE PRINCIPAL OCCUPATIONS CUSTOMARILY WORKING 72 HOURS AND OVER PER WEEK—BAR MILLS.

Occupations.	Normal number of employees.	Per cent of employees whose customary working hours per week were—	
		72 and over.	84 and over.
Stockers	916	7.97	.....
Chargers	496	15.73	.....
Heaters	795	8.81	0.63
Heaters' helpers	937	12.27	.53
Drag downs	443	14.67	.....
Roll engineers	302	48.34	10.59
Rolling crews:			
Rollers	484	9.71	.83
Roughers	1,369	11.25	.....
Catchers	421	5.94	.....
Stranders	782	7.54	.....
Finishers	296	14.53	.....
Hook ups	758	15.83	.....
Roll hands, other	575	21.22	.....
Hotbed men	1,315	18.86	.....
Shearmen and saw men	822	11.92	.49
Shearmen's and saw men's helpers	1,167	13.79	.51
Bundlers	498	12.05	.....
Laborers	[1] 2,354	20.13	3.48
Other occupations	1,416	18.01	2.05
Total, all occupations	[1] 16,146	14.94	1.04

[1] Not including 2 employees who worked 1 day only.

The next table is a summary showing the total employees in each of the six districts and in all districts customarily working each classified number of hours per week. In this table the time workers and the tonnage workers are shown separately for purposes of comparison.

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NUMBER OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK, BY DISTRICTS—BAR MILLS.

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
TIME WORKERS.												
New England	9	468	59.2	.....	66	87	294	21	.....	.....	.....	.....
Eastern	32	1,373	59.1	8	410	193	556	125	63	.....	18	.....
Pittsburgh	37	[1]4,750	63.1	441	351	490	553	2,090	653	63	93	16
Great Lakes and Middle West	20	1,456	64.2	9	217	163	246	499	246	55	31	.....
Southern	6	373	58.1	64	23	4	222	60	.....	.....	.....	.....
Pacific Coast	3	91	55.0	.....	79	12	.....	.....	.....	.....	.....	.....
Total, all districts	107	[1]8,511	62.2	522	1,146	949	1,871	2,785	962	118	142	16
TONNAGE WORKERS.												
New England	5	279	58.0	26	49	16	135	44	9	.....	.....	.....
Eastern	29	1,753	59.9	17	614	247	171	462	242	.....	.....	.....
Pittsburgh	31	3,558	61.0	790	54	681	113	1,187	728	.....	5	.....
Great Lakes and Middle West	23	1,700	58.7	284	269	393	186	377	164	23	4	.....
Southern	6	256	56.0	98	45	.....	20	93	.....	.....	.....	.....
Pacific Coast	2	89	54.8	.....	89	.....	.....	.....	.....	.....	.....	.....
Total, all districts	96	7,635	59.9	1,215	1,120	1,337	625	2,163	1,143	23	9	.....
TIME AND TONNAGE WORKERS.												
New England	9	747	58.8	26	115	103	429	65	9	.....	.....	.....
Eastern	35	3,126	59.6	25	1,024	440	727	587	305	.....	18	.....
Pittsburgh	37	[1]8,308	62.2	1,231	405	1,171	666	3,277	1,381	63	98	16
Great Lakes and Middle West	25	3,156	61.3	293	486	556	432	866	410	78	35	.....
Southern	6	629	57.3	162	68	4	242	153	.....	.....	.....	.....
Pacific Coast	3	180	54.9	.....	168	12	.....	.....	.....	.....	.....	.....
Total, all districts	115	[1]16,146	61.1	1,737	2,266	2,286	2,496	4,948	2,105	141	151	16

[1] Not including 2 employees who worked 1 day only.

The average customary working time per week for the 8,511 time workers was 62.2 hours, and for the 7,635 tonnage workers 59.9 hours. The table which follows shows for time workers and for tonnage workers combined the per cent of employees customarily working each classified number of hours per week. The total for all districts is placed in comparison.

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PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK, BY DISTRICTS—BAR MILLS.

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	9	747	58.8	3.48	15.39	13.79	57.43	8.70	1.20	.....	.....	.....
Eastern	35	3,126	59.6	.80	32.76	14.08	23.26	18.78	9.76	.....	0.58	.....
Pittsburgh	37	[1] 8,208	62.2	14.82	4.87	14.09	8.02	39.44	16.62	0.76	1.18	0.19
Great Lakes and Middle West	25	3,156	61.3	9.28	15.40	17.62	13.69	27.44	12.99	2.47	1.11	.....
Southern	6	629	57.3	25.76	10.81	.64	38.47	24.32	.....	.....	.....	.....
Pacific Coast	3	180	54.9	.....	93.33	6.67	.....	.....	.....	.....	.....	.....
Total, all districts.	115	[1]16,146	61.1	10.76	14.03	14.16	15.46	30.65	13.04	.87	.94	.10

[1] Not including 2 employees who worked 1 day only.

The average customary working time per week for the 16,146 employees was 61.1 hours. Compared with the other departments, a very small proportion, 14.95 per cent, were working 72 or more hours per week. The largest single group were reported as working more than 60 and less than 72 hours per week. For the remaining groups the proportions working each combination of hours was very nearly equal, approximately one-tenth, 10.76 per cent, being reported as working 48 hours and under per week.

The average hours per week, as shown by the above table, were slightly higher for the Pittsburgh district than for any of the other districts, although there was comparatively little difference between them. The shortest hours reported were in the case of the Pacific Coast district, although this included only 180 employees, and therefore is not entirely representative. There is, however, a considerable difference in the distribution of the employees under the various hours of work in the different districts. More than half of the employees in the New England district, 57.43 per cent, were reported as working 60 hours, while none of the three large districts showed more than 25 per cent working this number of hours per week. The Eastern district, on the other hand, shows practically one-third, 32.76 per cent, of the employees working over 48 and under 56 hours per week, which is practically balanced in the case of the Pittsburgh district by a large proportion who are shown as working over 60 and under 72 hours. In the Southern district an unusually large proportion of the employees are working 48 hours and under per week, more than one-fourth being reported under this head.

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DAYS WORKED PER WEEK.

Under each occupation the customary working days or turns per week are shown for each plant in Table I, Volume II of this report. These data are briefly summarized here. The table which follows shows for each occupation the number of plants reporting, the normal number of employees, and the number of employees whose customary working time was each specified number of days or turns per week:

NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK—BAR MILLS.

Occupations.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Bundlers	23	498	1	179	306	.....	12
Catchers:							
8-inch	12	27	.....	16	11	.....	.....
9-inch	10	34	2	21	8	.....	3
10-inch	21	69	10	30	29	.....	.....
12-inch	17	45	2	20	23	.....	.....
14-inch	5	16	.....	2	14	.....	.....
16-inch	19	45	5	32	8	.....	.....
18-inch	13	29	2	16	11	.....	.....
20-inch	8	26	.....	10	16	.....	.....
Not specified	36	130	3	92	35	.....	.....
Chargers	52	496	28	198	270	.....	.....
Cindermen	28	146	16	74	56	.....	.....
Cranemen	13	64	.....	18	31	6	9
Door operators	28	137	6	69	62	.....	.....
Drag downs	69	443	34	231	178	.....	.....
Finishers:							
8-inch	16	55	4	26	25	.....	.....
9-inch	14	28	.....	6	19	.....	3
10-inch	22	57	6	27	24	.....	.....
12-inch	10	22	2	6	14	.....	.....
14-inch	4	10	.....	2	8	.....	.....
16-inch	7	23	3	16	4	.....	.....
18-inch	7	15	.....	7	8	.....	.....
20-inch	5	10	.....	2	8	.....	.....
Not specified	27	76	1	19	56	.....	.....
Firemen, furnace	25	132	8	53	60	.....	11
Greasers	11	46	1	2	[1] 37	4	2
Heaters	115	795	59	444	280	.....	12
Heaters' helpers	96	937	55	399	469	.....	14
Hook ups:							
8-inch	4	11	.....	4	7	.....	.....
9-inch	3	16	.....	2	11	.....	3
10-inch	16	47	.....	14	33	.....	.....
12-inch	21	96	8	36	52	.....	.....
14-inch	6	31	.....	10	21	.....	.....
16-inch	22	91	8	65	18	.....	.....
18-inch	14	79	6	25	48	.....	.....
20-inch	10	107	.....	16	91	.....	.....
Not specified	44	280	11	98	171	.....	.....
Hotbed men	96	1,315	50	609	632	2	22
Laborers	83	[2] 2,354	353	365	1,506	16	114
Roll engineers	68	302	9	72	[3] 176	8	37
Rollers:							
8-inch	25	70	4	33	33	.....	.....
9-inch	27	63	9	28	23	.....	3
10-inch	36	77	10	32	35	.....	.....
12-inch	27	48	6	18	24	.....	.....
14-inch	8	15	2	2	11	.....	.....
16-inch	26	47	4	26	17	.....	.....
18-inch	14	25	4	9	12	.....	.....
20-inch	7	12	.....	5	7	.....	.....
Not specified	48	127	8	52	65	.....	2

[1] Including 2 who worked alternately 5 and 7 days per week.
[2] Not including 2 who worked only 1 day per week.
[3] Including 10 who worked alternately 5 and 7 days per week.

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NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK—BAR MILLS—Concluded.

Occupations.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Roll hands:							
8-inch	15	67	.....	26	41	.....	.....
9-inch	13	49	2	10	25	.....	12
10-inch	21	128	3	73	52	.....	.....
12-inch	14	57	6	34	17	.....	.....
14-inch	2	13	.....	.....	13	.....	.....
16-inch	11	57	.....	25	32	.....	.....
18-inch	10	39	2	14	23	.....	.....
20-inch	4	24	.....	5	19	.....	.....
Not specified	32	141	4	47	90	.....	.....
Roughers:							
8-inch	26	206	4	106	96	.....	.....
9-inch	28	182	12	106	52	.....	12
10-inch	34	198	20	74	104	.....	.....
12-inch	27	158	8	80	70	.....	.....
14-inch	7	44	.....	20	24	.....	.....
16-inch	26	112	8	60	44	.....	.....
18-inch	14	66	9	18	39	.....	.....
20-inch	10	45	.....	11	34	.....	.....
Not specified	49	358	17	159	182	.....	.....
Shearmen and saw men	95	822	35	333	442	4	8
Shearmen and saw men helpers	69	1,167	38	454	635	.....	40
Stockers	57	916	46	292	563	.....	15
Stranders:							
8-inch	22	160	.....	107	53	.....	.....
9-inch	23	120	7	79	31	.....	3
10-inch	26	156	12	91	53	.....	.....
12-inch	11	70	2	41	27	.....	.....
14-inch	4	22	.....	14	8	.....	.....
16-inch	4	9	.....	8	1	.....	.....
Not specified	29	245	18	105	122	.....	.....
Unclassified	79	891	31	250	580	.....	30
Total, all occupations	115	[1] 16,146	1,024	6,180	[2] 8,536	40	367

[1] Not including 2 who worked 1 day only.
[2] Including 12 who worked alternately 5 and 7 days.

Six days or turns per week was the customary working time for 52.86 per cent of the total number of employees in the bar mills. A very large proportion, however, 38.28 per cent, were reported as working 5 and 6 turns per week alternately, while a small number, 6.34 per cent, were reported as cutomarily working 5 days or turns per week. Only 2.27 per cent worked 7 days or turns per week. The bar mills, it may be noted in considering the relatively large number working 5 days or turns per week or 6 days or turns per week, are peculiar in the fact that in a large number of cases they are operated on the day turn only, no work being done at night. This is true in practically all the cases reporting 5 days per week as the customary working time. The table which follows shows for each of the principal occupations the per cent of employees customarily working each specified number of days or turns per week. The occupations are presented in the order of the processes of manufacture.

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PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK—BAR MILLS.

Occupations.	Number of plants.	Normal number of employees.	Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Stokers	57	916	5.02	31.88	61.46	.....	1.64
Chargers	52	496	5.65	39.92	54.44	.....	.....
Heaters	115	795	7.42	55.85	35.22	.....	1.51
Heaters' helpers	96	937	5.87	42.58	50.05	.....	1.49
Drag downs	69	443	7.67	52.14	40.18	.....	.....
Roll engineers	68	302	2.98	23.84	[1] 58.28	2.65	12.25
Rolling crews:							
Rollers	106	484	9.71	42.36	46.90	.....	1.03
Roughers	107	1,369	5.70	46.31	47.11	.....	.88
Catchers	83	421	5.70	56.77	36.82	.....	.71
Stranders	77	782	4.99	56.91	37.72	.....	.38
Finishers	60	296	5.41	37.50	56.08	.....	1.01
Hook ups	94	758	4.35	35.62	59.63	.....	.40
Roll hands other	71	575	2.96	40.70	54.26	.....	2.09
Hotbed men	96	1,315	3.80	46.31	48.06	.15	1.67
Shearmen and saw men	95	822	4.26	40.51	53.77	.49	.97
Shearmen's and saw men's helpers	69	1,167	3.26	38.90	54.41	.....	3.43
Bundlers	23	498	.20	35.94	61.45	.....	2.41
Laborers	83	[2] 2,354	15.00	15.51	63.08	.68	4.84
Other occupations	.....	1,416	4.38	32.91	58.33	.71	3.67
Total, all occupations	115	[2] 16,146	6.34	38.28	[1] 52.86	.25	2.27

[1] Including 10 who worked alternately 5 and 7 days per week.
[2] Not including 2 who worked 1 day per week only.

Inasmuch as each separate bar mill is operated as a unit and practically all employees are necessary during the entire time of its operation, very little difference exists between the different occupations as regards the number of days per week, the most striking difference perhaps existing in the case of the heaters and heaters' helpers. The heaters, it will be noted, show 55.85 per cent working 5 and 6 days or turns alternately and only 35.22 per cent working 6 days or turns per week. The heaters' helpers and the chargers, however, show these proportions practically reversed. This is due to the fact that on the first day of the week it is necessary for the heaters' helpers and chargers to begin work several hours or a full turn earlier than the start of the actual operation of the mill, in order to light up the furnaces and have the steel heated ready for rolling when the rolling crew comes on.

A comparison of the different districts shows that very little difference exists except in the case of the small districts, such as the Pacific Coast district, in which too small a number of employees is reported to be thoroughly representative.

The table which follows shows for each of the districts the number and per cent of employees customarily working each specified number of days or turns per week.

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NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—BAR MILLS.

Districts.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	9	747	53	372	318	.....	4	7.10	49.80	42.57	.....	0.54
Eastern	35	3,126	605	1,091	1,412	.....	18	19.35	34.90	45.17	.....	.58
Pittsburgh	37	[1] 8,306	130	3,362	[2] 4,544	34	238	1.56	40.47	[2] 54.69	0.41	2.86
Great Lakes and Middle West	25	3,156	180	1,028	1,835	6	107	5.70	32.57	58.14	.19	3.39
Southern	6	629	40	327	262	.....	.....	6.36	51.99	41.65	.....	.....
Pacific Coast	3	180	16	.....	164	.....	.....	8.89	.....	91.11	.....	.....
Total, all districts	115	[1] 16,146	1,024	6,180	[2] 8 535	40	367	6.34	38.28	[2] 52.86	.25	2.27

[1] Not including 2 employees who worked 1 day only.
[2] Including 12 employees who worked 5 and 7 days alternately.

GARRETT ROD MILLS.

INTRODUCTION.

Data relative to earnings and hours of labor in rod mills were reported for 2,779 employees in 26 plants. The mills producing wire rods are of such diverse character that a presentation of the data for all rod mills combined would have been almost valueless and in many cases misleading. The larger number of the rod mills, however, are of very nearly the same type, either the Garrett or the modified Garrett type. These mills employ a very large proportion of skilled men and the earnings and hours of labor of the men in the various occupations are therefore of great interest. For this reason the data relating to the Garrett rod mills, in which there were 1,915 employees, were separated from the data for the other rod mills and are shown in detail. This leaves a few mills differing very widely both as regards the method of operation and the character of workmen employed. Only 864 employees were reported in these miscellaneous mills, and the number of plants is so small that the presentation of the detailed data would be misleading and would reveal the operations of particular establishments. The data as to earnings and hours of labor which follow relate, therefore, only to rod mills of the Garrett type.

The data relative to earnings and hours of work are summarized briefly in the pages immediately following and analyzed in more detail on pages 298 to 311.

The general description of equipment and method of operation for rolling mills shown on page 146 applies to rod mills.

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SUMMARY OF EARNINGS AND HOURS AND DAYS OF WORK.

EARNINGS.

Data relative to earnings in Garrett rod mills were reported for 1,915 employees in special iron and steel occupations in 19 plants. The average earnings per hour for the 1,915 employees were 30.2 cents. Of the total employees 93.26 per cent were in the Eastern, Pittsburgh, and Great Lakes and Middle West districts. The other districts are therefore not shown separately although they are included in the total. Of those three districts the average earnings were lowest in the Eastern district and highest in the Pittsburgh district.

Of the 1,915 employees included in this report on Garrett rod mills, 25.59 per cent earned 16 and under 18 cents per hour, 12.17 per cent earned 20 and under 25 cents per hour, and 10.70 per cent earned 18 and under 20 cents per hour.

The per cent of employees earning each classified amount per hour, both for the total of all districts and for three principal districts separately, is shown in the following table:

PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY PRINCIPAL DISTRICTS—GARRETT ROD MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour—								
			Under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 cents and over.
Eastern	250	$0.287	0.80	10.40	15.20	10.80	18.40	11.20	18.00	6.00	9.20
Pittsburgh	674	.324	.59	2.08	29.53	9.50	15.58	9.50	6.82	4.75	21.66
Great Lakes and Middle West	862	.300	1.51	5.10	29.23	12.41	8.70	6.73	8.58	9.28	18.45
Total, all districts	1,915	.302	3.86	4.54	25.59	10.70	12.17	8.98	9.24	7.15	17.75

The most striking feature of this table is the relatively high average rate per hour, 30.2 cents, for all districts, and the unusually large proportion, 17.75 per cent, who earned 50 cents or more per hour. The proportion earning 50 cents and over in the Pittsburgh district was 21.66 per cent, and in the Great Lakes and Middle West district 18.45 per cent.

The summary in the form of cumulative percentages which follows shows that more than one-third of all employees, 33.99 per cent, earned less than 18 cents per hour, and more than one-half, 56.86 per cent, earned less than 25 cents per hour.

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PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY PRINCIPAL DISTRICTS—GARRETT ROD MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning per hour—							
			Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
Eastern	250	$0.287	0.80	11.20	26.40	37.20	55.60	66.80	84.80	90.80
Pittsburgh	674	.324	.59	2.67	32.20	41.70	57.28	66.78	73.60	78.35
Great Lakes and Middle West	862	.300	1.51	6.61	35.84	48.25	56.95	63.68	72.26	81.54
Total, all districts	1,915	.302	3.86	8.40	33.99	44.69	56.86	65.84	75.08	82.23

Only a very few employees were reported for either the New England district or the Southern district, and therefore those districts are omitted from this discussion as well as from the table, although they are included in the total. The earnings were under 18 cents for 35.84 per cent of the 862 employees in the Great Lakes and Middle West district, 32.20 per cent of the 674 employees in the Pittsburgh district, and 26.40 per cent of the employees in the Eastern district

The earnings were 25 cents or over for 42.72 per cent of the employees in the Pittsburgh district, 43.05 per cent of the employees in the Great Lakes and Middle West district, and 44.40 per cent of the employees in the Eastern district.

HOURS OF LABOR.

Customary working hours per full week were reported for 1,915 employees. Almost one-half, 48.15 per cent, of all employees worked over 60 and under 72 hours per week, and almost one-third, 31.28 per cent, worked 72 hours per week. An appreciable number, however, were employed 48 hours per week, which represents the use of three shifts of 8 hours each.

The per cent of employees working each classified number of hours per week for the principal districts and for all districts are shown in the table which follows:

PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY PRINCIPAL DISTRICTS—GARRETT ROD MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—					
			48 and under.	Over 48 and under 56.	56 and not over 60.	Over 60 and under 72.	72.	Over 72.
Eastern	250	60.3	.....	25.60	31.20	42.00	1.20	.....
Pittsburgh	674	67.2	6.23	2.08	.30	51.78	37.24	2.37
Great Lakes and Middle West	862	66.1	8.70	2.67	2.20	49.07	32.83	4.52
Total, all districts	1,915	66.1	6.11	5.27	5.27	48.15	31.28	3.92

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In only three districts, the Eastern, Pittsburgh, and Great Lakes and Middle West, are any considerable number of employees represented. The average customary working hours per week in the Eastern district are 60.3, which are considerably below the average in either of the other principal districts, although no plant in the Eastern district was on a three-shift system. The customary working hours per week were 60 or less for 56.80 per cent of all employees in the Eastern district, 13.57 per cent of all employees in the Great Lakes and Middle West district, and 8.61 per cent of all employees in the Pittsburgh district. The customary working hours per week were 72 or over for 39.61 per cent of all employees in the Pittsburgh district, 37.35 per cent of all employees in the Great Lakes and Middle West district, and only 1.20 per cent of all employees in the Eastern district.

The predominant hours were over 60 and under 72 for each of the principal districts and for all districts. In this group were 51.78 per cent of the employees in the Pittsburgh district, 49.19 per cent of those in the Great Lakes and Middle West district, 42 per cent of those in the Eastern district, and 48.15 per cent of those in all districts.

DAYS PER WEEK.

Five and 6 days or turns per week, alternating, was the customary working time for 967 employees or 50.50 per cent of the 1,915 employees in the special occupations in the 19 plants. Six days or turns per week was the customary working time for 791 employees, or 41.31 per cent of the total. Five days or turns per week was the customary working time for 89 employees or 4.65 per cent of the total, and 7 days or turns per week was the customary working time for only 68 employees, or 3.55 per cent of the total.

DESCRIPTION OF OCCUPATIONS.

In the following description of occupations, the main occupation name shown represents the term retained in the report under which data as to wages and hours of labor are presented. The names shown in parenthesis represent the most important minor occupations included under the name used in this report as well as other terms used in various plants to indicate the same class of work. In the first paragraph, "Duties," is given a description of the functions which employees in the occupation perform and the method by which the work is done. In the second paragraph, "Nature of work," two points are covered—first, an indication of the type of workmen required for the position, and, second, the conditions under which the work is done. The occupations are presented in the order of the processes of manufacture.

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STOCKERS; CHARGERS; CHARGING-MACHINE OPERATORS; HEATERS; HEATER'S HELPERS; ROLL ENGINEERS.

See same occupations, pages 261 to 263.

ROLLERS.

DUTIES.—Duties are much the same as in bar mills except that instead of being practically a foreman of the rolling crew, the roller has full charge of the department, being subordinate only to the superintendent. The product must be gauged much more frequently in rod mills than in other mills.

NATURE OF WORK.—Very responsible, requiring long training and a high degree of skill and special knowledge. For the production of a perfect wire rod every part of the mill must be working properly, and with the large number of stands of rolls and the high speed at which they are driven constant attention is required to maintain this condition.

ROLLERS' ASSISTANTS.

DUTIES.—Assist the roller in seeing that the mill is kept in proper working condition and act as roller in his absence.

NATURE OF WORK.—The responsibility is less than that of the roller but the work and knowledge required are of a similar nature. The position may be regarded as one of training for that of roller.

ROUGHERS.

(Including Bull-Doggers.)

DUTIES.—Similar to that of roughers in bar mills, handling billets of moderate size. There are usually three stands of 16-inch roughing rolls. Whenever the roughing is done in a train of continuous rolls the man tending this train has been classed with roll hands in the tabulation. The roughers, together with all other roll hands, assist in changing rolls and in straightening up in case of trouble with cobbles or tangled rods.

NATURE OF WORK.—Similar to that of roughers in bar mills in every respect.

OVAL ROLL HANDS, AND DIAMOND ROLL HANDS, AND FINISHERS.

DUTIES.—After the billet has been roughed out into a long bar, the man working at the first oval stand seizes the end with tongs and loops it around, as described under bar mills (p. 264), thrusting the end into the proper pass. As the end issues on the other side of the rolls it enters a semicircular trough, which automatically loops the rod around and enters it in the next pass. At this point it is handled by another man, as the looping guides can be used only on one side of the rolls. The duties of the oval and the diamond roll hands are identical,

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the names being derived from the shape of the pass which they tend. In case the end of the rod becomes split, it must be cut off before entering the next pass, as the split may develop into a long splinter. The duties of the finisher are exactly the same as those of the diamond and the oval roll hands, except that he is on the last pass, in which the rod is rolled to a true round.

NATURE OF WORK.—These positions require great dexterity, as the metal is running at a very rapid rate and the rod must be caught very near the end, otherwise it is difficult to get the end into the pass properly. Guides are used on all the stands to assist in entering the piece properly. The work is very hard on account of the speed at which the mill is run, and because two or more rods are commonly passing at the same time through each set of rolls. On the most highly speeded mills rolling small sizes there may be as many as five rods passing through the finishing stand at the same time, and running at the rate of some 20 miles per hour. As the mills are successively speeded up from the roughing to the finishing end, the difficulty of the work on the last stands is much greater than on the earlier stands. The positions carry with them considerable hazard of being badly burned or killed by the hot rods. The danger is greatly increased when there is trouble with the mill (usually a "cobble") or an entanglement of the rods, in which case the red-hot rods twist all over the floor much quicker than they can be handled. In a large number of plants arrangements are made to relieve these employees by spell hands.

ROLL HANDS.

DUTIES.—Include all employees around the rolls not in the occupations described above. These employees are performing miscellaneous duties, such as tending water at the rolls, acting as spell hands to any of the regular roll hands, or performing special duties required by local conditions.

NATURE OF WORK.—The character of the employees in this group varies widely from unskilled laborers to men capable of filling the most highly skilled positions in the mill.

HOOKERS.

(Including Loop Men.)

DUTIES.—Use long steel rods hooked at the ends with which they stretch out along the floor the loops which form on both sides of the mill and prevent them from being twisted or entangled.

NATURE OF WORK.—The work of dragging out the hot rods as they issue from the rolls and of preventing their entanglement requires great agility. It is frequently performed by boys between 16 and

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20 years of age, because of their activity. Constant attention is required at all times to avoid being badly burned, and the position is one of considerable hazard when there is a "cobble" or the rods are otherwise entangled.

REELERS.

DUTIES.—Operate levers which control the reels on which the rods are wound when they issue from the rolls. The reels are arranged so that they can drop the coil automatically as soon as the rod is completely reeled.

NATURE OF WORK.—The position requires some experience but does not demand a highly skilled man.

TAKE-OFFS.

DUTIES.—Remove the coils of wire rods from the conveyor, by which they are carried from the reels to the shipping department. The reels are thoroughly cooled by the time they reach the shippers.

NATURE OF WORK.—Unskilled work, not very heavy, and carrying no particular hazard.

SHEARMEN.

DUTIES.—Shear the scrap and cobb'ed rods and other defective material nto short pieces, which can be used in the open hearth.

NATURE OF WORK.—Unskilled work, requiring very little experience.

SCRAP MEN.

(Including Scrap Pickers.)

DUTIES.—Pick up sheared and other scrap and load it into boxes for the open hearth or pack it for shipment.

NATURE OF WORK.—Unskilled light work.

CONVEYOR MEN; CRANEMEN; ENGINEERS, STATIONARY; GREASERS; LABORERS.

See same occupations, pages 160, 162, and 267.

UNCLASSIFIED.

Include much the same class as have been described under this head, page 267.

EARNINGS AND HOURS AND DAYS OF WORK, BY OCCUPATIONS.

EARNINGS PER HOUR.

Data relative to earnings per hour for each occupation and each plant are shown in detail in Table I, Volume II, and for each occupation and each district in Table II. Table I shows for each plant separately customary number of working days per week, customary

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number of working hours per day, normal number of employees, average earnings per hour, and number of employees earning each classified amount per hour. Table II shows for each occupation and each district the number of plants reporting data, the number of employees included, and the average earnings per hour. The table is so arranged that a comparison is easily made of the earnings of time workers and of tonnage workers in the different occupations within each of the districts, and also of the earnings of each of the two classes of workers in the several districts.

The tables here presented summarize the information concerning earnings. The table which follows is a summary of Table II, with the exception that time and tonnage workers are not shown separately but are combined. The data are shown only for the principal districts, as the number of employees in the other districts, as has already been noted, is too small to admit of comparison.

AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY PRINCIPAL DISTRICTS—GARRETT ROD MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Occupations.	Eastern district.	Pittsburgh district.	Great Lakes and Middle West district.	Total, all districts.
Chargers:				
Plants	2	6	4	12
Employees	4	28	14	46
Average earnings per hour...cents..	20.8	18.9	18.1	18.7
Conveyor men:				
Plants	1	4	6	11
Employees	2	22	35	59
Average earnings per hour...cents..	20.5	18.3	17.8	18.1
Cranemen:				
Plants	1	3	3	7
Employees	3	16	8	27
Average earnings per hour...cents..	18.3	20.4	18.5	19.7
Diamond roll hands:				
Plants	1	6	8	17
Employees	4	30	50	88
Average earnings per hour...cents..	54.5	47.7	51.8	49.6
Engineers, stationary:				
Plants	.....	1	2	3
Employees	.....	3	4	7
Average earnings per hour...cents..	.....	24.7	20.1	22.1
Finishers:				
Plants	3	6	7	18
Employees	10	28	24	66
Average earnings per hour...cents..	54.4	62.3	63.6	60.8
Greasers:				
Plants	1	5	5	11
Employees	2	14	16	32
Average earnings per hour...cents..	15.3	18.5	17.1	17.5
Heaters:				
Plants	3	5	7	16
Employees	6	13	15	36
Average earnings per hour...cents..	49.6	67.4	61.0	59.3
Heaters' helpers:				
Plants	2	6	7	16
Employees	14	31	48	94
Average earnings per hour...cents..	28.8	34.3	26.5	29.3
Hookers:				
Plants	3	5	8	18
Employees	18	41	80	139
Average earnings per hour...cents..	18.6	19.2	17.2	18.4
Laborers:				
Plants	1	3	6	11
Employees	11	72	99	220
Average earnings per hour...cents..	14.7	16.6	16.4	15.4

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AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED), BY PRINCIPAL DISTRICTS—GARRETT ROD MILLS—Concluded.

Occupations.	Eastern district.	Pittsburgh district	Great Lakes and Middle West district.	Total, all districts.
Oval roll hands:				
Plants	3	6	7	18
Employees	34	71	81	200
Average earnings per hour, cents	36.0	51.3	52.2	48.3
Pushers:				
Plants	1	3	3	8
Employees	2	6	8	18
Average earnings per hour, cents	19.4	24.2	17.1	20.3
Reelers:				
Plants	3	5	8	18
Employees	8	16	22	51
Average earnings per hour, cents	17.6	18.8	17.9	18.7
Roll engineers:				
Plants	3	6	8	19
Employees	14	33	34	86
Average earnings per hour, cents	22.7	28.5	28.2	27.2
Rollers:				
Plants	2	4	6	14
Employees	4	8	12	28
Average earnings per hour, cents	110.6	101.3	111.1	102.2
Rollers' assistants:				
Plants	2	5	8	15
Employees	8	27	19	54
Average earnings per hour, cents	44.4	80.1	80.9	75.0
Roll hands:				
Plants	1	4	7	14
Employees	4	22	48	78
Average earnings per hour, cents	30.0	27.9	33.3	31.2
Roughers:				
Plants	3	5	7	17
Employees	24	28	59	116
Average earnings per hour, cents	34.6	42.5	41.2	40.3
Scrap men:				
Plants	.....	5	4	9
Employees	.....	44	36	80
Average earnings per hour, cents	.....	17.4	16.7	17.1
Shearmen:				
Plants	2	4	6	13
Employees	4	10	15	31
Average earnings per hour, cents	18.4	21.7	21.7	22.6
Stockers:				
Plants	3	3	6	12
Employees	19	18	64	101
Average earnings per hour, cents	21.9	22.1	20.2	20.9
Take-offs:				
Plants	2	3	2	8
Employees	17	29	21	69
Average earnings per hour, cents	16.5	18.5	17.9	18.0
Unclassified:				
Plants	3	6	8	19
Employees	38	64	60	169
Average earnings per hour, cents	19.5	20.3	18.8	19.5

Of the total employees in the Garrett rod mills 93.26 per cent were reported in the Pittsburgh, Great Lakes and Middle West, and Eastern districts. For this reason the employees in the other districts are not reported separately, although they are included in the total for all districts. In the above table the employees are entered in 24 occupational classifications (including unclassified). In 15 of these 24 classifications the Pittsburgh district reported the highest average earnings. In 5 of the classifications the Great Lakes and Middle West district reported the highest average earnings, and in 3 of the cases the Eastern district reported the highest average earnings. In one case the Great Lakes and Middle West and the Pittsburgh districts reported the same average earnings per hour.

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The next table shows the earnings of the time workers and tonnage workers for all districts combined. With one exception, that of rollers, the tonnage workers reported decidedly higher earnings per hour than the time workers. In the case of the rollers the difference in favor of the time workers is very small and arises largely from the fact that the most highly skilled men in this occupation are paid monthly salaries. It may be noted further, in considering this occupation, that this is the most highly paid occupation in the entire industry and that the duties of these employees are almost altogether supervisory. It may be noted in considering the differences that exist in the various occupations that the tonnage workers, even in the comparatively unskilled occupations, such as stockers and scrap men, earn appreciably higher rates per hour than the time workers.

COMPARISON OF AVERAGE EARNINGS PER HOUR OF TIME WORKERS AND OF TONNAGE WORKERS, BY OCCUPATIONS—GARRETT ROD MILLS.

Occupations.	Time.			Tonnage.			Total time and tonnage combined.		
	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.
Chargers	5	26	$0.180	7	20	$0.195	12	46	$0.187
Conveyor men	5	29	.174	6	30	.189	11	59	.181
Cranemen	6	18	.167	2	9	.230	7	27	.197
Diamond roll hands	1	2	.333	16	86	.501	17	88	.496
Engineers, stationary	3	7	.221	.....	.....	.....	3	7	.221
Finishers	2	4	.460	17	62	.618	18	66	.608
Greasers	9	25	.174	3	7	.181	11	32	.175
Heaters	2	4	.443	15	32	.617	16	36	.593
Heaters' helpers	5	31	.228	12	63	.323	16	94	.293
Hookers	8	83	.163	10	76	.210	18	159	.184
Laborers	11	220	.154	.....	.....	.....	11	220	.154
Oval roll hands	1	6	.292	17	194	.491	18	200	.483
Pushers	3	6	.196	5	12	.209	8	18	.203
Reelers	8	23	.169	10	28	.204	18	51	.187
Roll engineers	19	80	.271	1	6	.288	19	86	.272
Rollers	10	19	1.048	5	9	.963	14	28	1.022
Rollers' assistants	1	1	.423	15	53	.755	15	54	.750
Roll hands	6	28	.233	9	50	.356	14	78	.312
Roughers	3	6	.322	14	110	.408	17	116	.403
Scrap men	6	46	.165	3	34	.180	9	80	.171
Shearmen	6	15	.217	7	16	.234	13	31	.226
Stockers	4	21	.170	9	80	.220	12	101	.209
Take-offs	4	34	.172	5	35	.188	8	69	.180
Unclassified	13	79	.193	11	90	.197	19	169	.195

From the above table it may be noted that there is an extremely wide difference between the earnings of the employees in different occupations in this department, ranging from the laborers and hookers, who show an average earning per hour of 15.4 cents and 18.4 cents, respectively, to that of the rollers and rollers' assistants, who earn $1.022 and $0.750 per hour, respectively. None of the rollers earn less than 50 cents per hour and none of the laborers, on the other hand, earn more than 18 cents per hour. In considering the high rates paid in this department, however, it is proper to note that those earning the very high rate of 50 cents per hour and over constitute only 17.75 per cent of the entire number of employees.

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The next table shows for each of the principal occupations the average earnings per hour and the per cent of employees earning each classified amount per hour. The occupations are in order following the processes of manufacture.

PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS—GARRETT ROD MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Stockers	12	101	$0.209	.....	.....	3.96	31.68	21.78	29.70	.....	12.87	.....	.....	.....	.....
Heaters	16	36	.593	.....	.....	.....	.....	.....	.....	.....	5.56	25.00	25.00	19.44	25.00
Heaters' helpers	16	94	.293	.....	.....	.....	4.26	6.38	14.89	43.62	17.02	10.64	3.19	.....	.....
Roll engineers	19	86	.272	.....	.....	.....	.....	6.98	11.63	56.98	24.42	.....	.....	.....	.....
Rollers	14	28	1.022	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.57	3.57	92.86
Rollers' assistants	15	54	.750	.....	.....	.....	.....	.....	3.70	.....	1.85	11.11	7.41	16.67	59.26
Roughers	17	116	.403	.....	.....	.....	.....	.....	1.72	17.24	36.21	32.76	8.62	3.45	.....
Oval roll hands	18	200	.483	.....	.....	.....	1.00	.....	1.00	8.00	17.00	22.50	27.50	23.00	.....
Diamond roll hands	17	88	.496	.....	.....	.....	.....	.....	.....	6.82	11.36	9.09	59.09	13.64	.....
Finishers	18	66	.608	.....	.....	.....	.....	.....	.....	.....	6.06	9.09	22.73	45.45	16.67
Hookers	18	159	.184	.....	8.18	13.84	32.70	16.98	22.01	3.77	2.52	.....	.....	.....	.....
Other roll hands	14	78	.312	.....	.....	6.41	.....	10.26	15.38	19.23	29.49	14.10	5.13	.....	.....
Reelers	18	51	.187	.....	.....	3.92	49.02	19.61	19.61	7.84	.....	.....	.....	.....	.....
Laborers	11	220	.154	.....	21.82	10.45	67.73	.....	.....	.....	.....	.....	.....	.....	.....
Other occupations	.....	538	.188	.93	1.49	5.76	42.01	23.42	21.56	2.79	1.30	.74	.....	.....	.....
Total all occupations	19	1,915	.302	.26	3.60	4.54	25.59	10.70	12.17	8.98	9.24	7.15	7.99	5.09	4.07

The next summary shows for each of the principal districts the number of plants reporting, the normal number of employees, the average earnings per hour, and the number of employees earning each classified amount per hour. Time workers and tonnage workers are shown separately and the two classes are also combined.

NUMBER OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS, BY PRINCIPAL DISTRICTS—GARRETT ROD MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Number of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
TIME WORKERS.															
Eastern	3	36	$0.243	2	.....	16	1	5	6	4	.....	.....	.....	.....	2
Pittsburgh	6	313	.222	.....	4	14	175	38	30	29	10	3	3	1	6
Great Lakes and Middle West	8	376	.206	3	6	34	200	34	42	22	26	.....	.....	.....	9
Total, all districts	19	813	.210	5	65	67	377	84	81	65	40	6	4	1	18

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NUMBER OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS, BY PRINCIPAL DISTRICTS—GARRETT ROD MILLS—Concluded.

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Number of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
TONNAGE WORKERS.															
Eastern	3	214	.296	.....	.....	10	37	22	40	24	45	15	11	7	[illegible]
Pittsburgh	6	361	.398	.....	.....	.....	24	26	75	35	36	29	51	50	35
Great Lakes and Middle West	8	486	.395	.....	4	10	52	73	33	36	48	80	79	51	20
Total, all districts	18	1,102	.378	.....	4	20	113	121	152	107	137	131	149	108	[illegible]
TIME AND TONNAGE WORKERS.															
Eastern	3	250	.287	2	.....	26	38	27	46	28	45	15	11	7	[illegible]
Pittsburgh	6	674	.324	.....	4	14	199	64	105	64	46	32	54	51	41
Great Lakes and Middle West	8	862	.300	3	10	44	252	107	75	58	74	80	79	51	29
Total, all districts	19	1,915	.302	5	69	87	490	205	233	172	177	137	153	109	78

The average hourly earnings for the 1,915 employees in Garrett rod mills was 30.2 cents per hour. This, it may be noted, was the highest average shown in any of the departments included in this report. This high average is due not only to the fact that the earnings of the more highly paid employees range extremely high, but also because there is an unusually small proportion of unskilled workmen. The average earnings of the 813 employees paid on the time basis was 21 cents per hour, and for the 1,102 employees paid on the tonnage basis 37.8 cents per hour. This marked difference in favor of the tonnage workers is due not only to the fact that in the separate occupations the tonnage workers are reported as earning considerably higher rates, but also to the fact that all of the laborers, who constitute about one-ninth of the total number of employees, are time workers.

The lowest rate reported was under 12 cents per hour, and the highest over $1.25 per hour. Only 8 employees, however, were reported at this highest rate, and only 5 at the very low rate of less than 12 cents per hour. The distribution of earnings is more clearly shown in the table which follows. This table shows the per cent of employees earning each classified amount per hour, the percentages being computed from the third section of the total immediately preceding, in which time workers and tonnage workers are combined.

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PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS, BY PRINCIPAL DISTRICTS—GARRETT ROD MILLS.

[Data are not shown separately for districts in which only 1 plant reported. All plants, however, are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Eastern	3	250	$0.287	0.80	.....	10.40	15.20	10.80	18.40	11.20	18.00	6.00	4.40	2.80	2.00
Pittsburgh	6	674	.324	.....	0.59	2.08	29.53	9.50	15.58	9.50	6.82	4.75	8.01	7.57	6.08
Great Lakes and Middle West	8	862	.300	.35	1.16	5.10	29.23	12.41	8.70	6.73	8.58	9.28	9.16	5.92	3.36
Total, all districts	19	1,915	.302	.26	3.60	4.54	25.59	10.70	12.17	8.98	9.24	7.15	7.99	5.69	4.07

From the above table it is seen that 25.59 per cent of the employees earned 16 and under 18 cents per hour, 12.17 per cent earned 20 and under 25 cents per hour, and 10.70 per cent earned 18 and under 20 cents per hour. Therefore, it may be seen that 48.46 per cent earned 16 and under 25 cents per hour. The remaining employees ranged in steadily decreasing groups as high as $1.25 per hour and over.

The summary in the form of cumulative percentages which follows shows that approximately one-third, 33.99 per cent, earned less than 18 cents per hour, and that 56.87 per cent earned less than 25 cents per hour. A large proportion, however, 24.92 per cent, earned 40 cents or more per hour.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR—GARRETT ROD MILLS.

Earnings per hour.	Number of employees.	Per cent of total number of employees.	Earnings per hour.	Number of employees.	Per cent of total number of employees.
Under 14 cents	74	3.86	Under 25 cents	1,089	56.86
Under 16 cents	161	8.40	Under 30 cents	1,261	65.84
Under 18 cents	651	33.99	Under 40 cents	1,438	75.08
Under 20 cents	856	44.69	Under 50 cents	1,575	82.23

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The per cent of employees earning less than specified amounts per hour for each of the principal districts and for all districts is shown in the table which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY PRINCIPAL DISTRICTS—GARRETT ROD MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning, per hour—							
			Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
Eastern	250	$0.287	0.80	11.20	26.40	37.20	55.60	66.80	84.80	90.80
Pittsburgh	674	.324	.59	2.67	32.20	41.70	57.28	66.78	73.60	78.35
Great Lakes and Middle West	862	.300	1.51	6.61	35.84	48.25	56.95	63.68	72.26	81.54
Total, all districts	1,915	.302	3.86	8.40	33.99	44.69	56.86	65.84	75.08	82.23

Although the general distribution of earnings in the different districts, as shown in the above table, is very much the same, there are some striking points which may be remarked upon. The Pittsburgh district, for example, shows a much larger percentage earning under 18 cents per hour than the Eastern district, but this is more than balanced by the fact that a very much larger percentage of employees in the Pittsburgh district earn 50 cents or more per hour than in the Eastern district. The differences between the Pittsburgh and Great Lakes and Middle West districts are so slight as to be of almost no consequence.

Of the three principal districts considered here, the Pittsburgh district shows decidedly higher average earnings per hour than either the Great Lakes and Middle West or the Eastern district. The Great Lakes and Middle West district, it may be noted, shows average earnings per hour of 30 cents, which is almost midway between the average for the Pittsburgh and the Eastern districts.

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working hours per week are presented in detail for each occupation and each plant in Table I, Volume II of this report. These data are summarized in the text tables which follow. The first of these tables shows for each occupation the number of plants reporting, the normal number of employees, the average customary working hours per week, and the number of employees whose customary working time was each classified number of hours per week.

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NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK—GARRETT ROD MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Chargers	12	46	68.4	.....	2	2	.....	14	28	.....	.....	.....
Conveyor men	11	59	67.5	.....	2	.....	.....	34	23	.....	.....	.....
Cranemen	7	27	69.6	.....	.....	.....	.....	18	5	.....	4	.....
Diamond roll hands	17	88	60.7	30	.....	.....	.....	42	16	.....	.....	.....
Engineers, stationary	3	7	74.4	.....	.....	.....	.....	2	2	1	2	.....
Finishers	18	66	64.4	6	4	2	.....	40	14	.....	.....	.....
Greasers	11	32	70.3	.....	.....	.....	.....	15	15	.....	2	.....
Heaters	16	36	63.9	6	2	2	.....	16	8	.....	2	.....
Heaters' helpers	16	94	65.0	3	6	12	.....	46	26	.....	1	.....
Hookers	18	159	66.7	.....	14	6	.....	80	59	.....	.....	.....
Laborers	11	220	71.9	.....	17	.....	5	36	113	4	45	.....
Oval roll hands	18	200	60.8	54	14	6	.....	92	34	.....	.....	.....
Pushers	8	18	68.0	.....	.....	.....	.....	12	6	.....	.....	.....
Reelers	18	51	66.7	.....	4	2	.....	26	19	.....	.....	.....
Roll engineers	19	86	69.0	.....	1	.....	.....	49	28	2	6	.....
Rollers	14	28	66.8	.....	.....	4	1	16	5	.....	2	.....
Rollers' assistants	15	54	62.4	12	.....	2	3	26	11	.....	.....	.....
Roll hands	14	78	66.8	.....	.....	4	6	42	26	.....	.....	.....
Roughers	17	116	64.7	3	6	6	.....	88	13	.....	.....	.....
Scrap men	9	80	68.1	.....	3	.....	1	37	39	.....	.....	.....
Shearmen	13	31	64.8	3	.....	2	.....	18	8	.....	.....	.....
Stockers	12	101	63.7	.....	13	2	6	72	8	.....	.....	.....
Take-offs	8	69	66.6	.....	8	.....	.....	30	31	.....	.....	.....
Unclassified	19	169	66.4	.....	5	26	1	71	62	1	3	.....
Total, all occupations	19	1,915	66.1	117	101	78	23	922	599	8	67	.....

The table which follows shows for each of the principal occupations the per cent of employees working each classified number of hours. A considerable proportion of the employees in the skilled occupations directly connected with production worked 48 hours and under per week. It should be noted, however, that they constituted 6.11 per cent of the total number of employees in all occupations. The only occupation showing a considerable proportion of the employees working 84 hours per week was that of laborer, although a few of the heaters, rollers, and roll engineers were required to be on duty 7 days per week. The occupations are presented in the order of the processes of manufactures.

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PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK—GARRETT ROD MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Stockers	12	101	63.7	.....	12.87	1.98	5.94	71.29	7.92	.....	.....	.....
Heaters	16	36	63.9	16.67	5.56	5.56	.....	44.44	22.22	.....	5.56	.....
Heaters' helpers	16	94	65.0	3.19	6.38	12.77	.....	48.94	27.66	.....	1.06	.....
Roll engineers	19	86	69.0	.....	1.16	.....	.....	56.98	32.56	2.33	6.98	.....
Rollers	14	28	66.8	.....	.....	14.29	3.57	57.14	17.86	.....	7.14	.....
Rollers' assistants	15	54	62.4	22.22	.....	3.70	5.56	48.15	20.37	.....	.....	.....
Roughers	17	116	64.7	2.59	5.17	5.17	.....	75.86	11.21	.....	.....	.....
Oval roll hands	18	200	60.8	27.00	7.00	3.00	.....	46.00	17.00	.....	.....	.....
Diamond roll hands	17	88	60.7	34.09	.....	.....	.....	47.73	18.18	.....	.....	.....
Finishers	18	66	64.4	9.09	6.06	3.03	.....	60.61	21.21	.....	.....	.....
Hookers	18	159	66.7	.....	8.81	3.77	.....	50.31	37.11	.....	.....	.....
Other roll hands	14	78	66.8	.....	.....	5.13	7.69	53.85	33.33	.....	.....	.....
Reelers	18	51	66.7	.....	7.84	3.92	.....	50.98	37.25	.....	.....	.....
Laborers	11	220	71.9	.....	7.73	.....	2.27	16.36	51.36	1.82	20.45	.....
Other occupations	.....	538	67.4	.56	3.72	5.58	.37	46.65	40.71	.37	2.04	.....
Total, all occupations	19	1,915	66.1	6.11	5.27	4.07	1.20	48.15	31.28	.42	3.50	.....

The average customary working time per week for the 1,915 employees in the special iron and steel occupations in 19 plants was 66.1 hours. More than 80 per cent of the employees worked from 60 to 72 hours per week. Only 3.92 per cent of the total number worked more than 72 hours per week, and on the other hand only 6.11 per cent worked as little as 48 hours per week.

The next summary shows for each of the principal occupations the per cent of employees customarily working 72 hours and over and the per cent customarily working 84 hours:

PER CENT OF EMPLOYEES IN THE PRINCIPAL OCCUPATIONS CUSTOMARILY WORKING 72 HOURS AND OVER PER WEEK—GARRETT ROD MILLS.

Occupations.	Normal number of employees.	Per cent of employees whose customary working hours per week were—	
		72 and over.	84.
Stockers	101	7.92	.....
Heaters	36	27.78	5.56
Heaters' helpers	94	28.72	1.06
Roll engineers	86	41.87	6.98
Rollers	28	25.00	7.14
Rollers' assistants	54	20.37	.....
Roughers	116	11.21	.....
Oval roll hands	200	17.00	.....
Diamond roll hands	88	18.18	.....
Finishers	66	21.21	.....
Hookers	159	37.11	.....
Roll hands, other	78	33.33	.....
Reelers	51	37.25	.....
Laborers	220	73.63	20.45
Other occupations	538	43.12	2.04
Total, all occupations	1,915	35.20	3.50

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The next table is a summary showing the number of employees customarily working each classified number of hours per week for each of the principal districts. The time and tonnage workers are shown separately. It should be noted that, although the total includes the data for all districts, two of the districts are not shown in detail on account of the small number of employees included.

NUMBER OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK, BY PRINCIPAL DISTRICTS—GARRETT ROD MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—							
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
TIME WORKERS.												
Eastern	3	36	64.1	.....	1	4	3	28	.....	.....	.....	.....
Pittsburgh	6	313	69.9	.....	14	.....	2	90	191	6	10	.....
Great Lakes and Middle West	8	376	69.3	6	23	6	10	105	187	2	37	.....
Total, all districts	19	813	69.8	6	38	10	17	227	440	8	67	.....
TONNAGE WORKERS.												
Eastern	3	214	59.6	.....	63	68	3	77	3	.....	.....	.....
Pittsburgh	6	361	64.9	42	.....	.....	.....	259	60	.....	.....	.....
Great Lakes and Middle West	8	486	63.7	69	.....	.....	3	318	96	.....	.....	.....
Total, all districts	18	1,102	63.4	111	63	68	6	695	159	.....	.....	.....
TIME AND TONNAGE WORKERS.												
Eastern	3	250	60.3	.....	64	72	6	105	3	.....	.....	.....
Pittsburgh	6	674	67.2	42	14	.....	2	349	251	6	10	.....
Great Lakes and Middle West	8	862	66.1	75	23	6	13	423	283	2	37	.....
Total, all districts	19	1,915	66.1	117	101	78	23	922	599	8	67	.....

It may be noted in the above table that there is a considerable difference between the average hours per week for the time workers and the tonnage workers. The longer hours shown for the time workers are in a large part due to the fact that, as has already been noted, the laborers, who are paid entirely on a time basis, work much longer hours than other employees. The relation of the principal districts is, however, more clearly shown in the table which follows, which shows for time workers and tonnage workers combined the per cent of employees customarily working each classified number of hours per week.

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PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK, BY PRINCIPAL DISTRICTS—GARRETT ROD MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Eastern	3	250	60.3	.....	25.60	28.80	2.40	42.00	1.20	.....	.....	.....
Pittsburgh	6	674	67.2	6.23	2.08	.....	.30	51.78	37.24	0.89	1.48	.....
Great Lakes and Middle West	8	862	66.1	8.70	2.67	.70	1.51	49.07	32.83	.23	4.29	.....
Total, all districts	19	1,915	66.1	6.11	5.27	4.07	1.20	48.15	31.28	.42	3.50	.....

It may be noted in the above table that while there is little difference between the Pittsburgh and the Great Lakes and Middle West districts, the average hours worked per week are much shorter in the Eastern district. This is true in spite of the fact that the only plants reporting employees working 48 hours per week or less were located in the Pittsburgh and Great Lakes and Middle West districts.

In the Eastern district only 1.20 per cent of the total number of employees worked as many as 72 hours per week, while in the Pittsburgh and Great Lakes and Middle West districts 39.61 and 37.35 per cent, respectively, worked 72 hours and over. Considering the districts as a whole, only 11.38 per cent of all the employees worked less than 56 hours per week.

DAYS WORKED PER WEEK.

Under each occupation the customary working days or turns per week are shown in detail for each plant in Table I, Volume II of this report. These data are briefly summarized here. The first table shows for each occupation the number of plants reporting, the normal number of employees, and the number of employees whose customary working time was each specified number of days or turns per week.

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NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK—GARRETT ROD MILLS.

Occupations.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Chargers	12	46	2	16	28	.....	.....
Conveyor men	11	59	2	34	23	.....	.....
Cranemen	7	27	.....	18	5	.....	4
Diamond roll hands	17	88	.....	42	46	.....	.....
Engineers, stationary	3	7	.....	2	2	.....	3
Finishers	18	66	4	42	20	.....	.....
Greasers	11	32	.....	12	18	.....	2
Heaters	16	36	2	18	14	.....	2
Heaters' helpers	16	94	.....	64	29	.....	1
Hookers	18	159	6	92	61	.....	.....
Laborers	11	220	14	12	149	.....	45
Oval roll hands	18	200	14	98	88	.....	.....
Pushers	8	18	.....	12	6	.....	.....
Reelers	18	51	4	28	19	.....	.....
Roll engineers	19	86	6	40	34	.....	6
Rollers	14	28	1	20	5	.....	2
Rollers' assistants	15	54	3	28	23	.....	.....
Roll hands	14	78	.....	52	26	.....	.....
Roughers	17	116	6	94	16	.....	.....
Scrap men	9	80	1	37	42	.....	.....
Shearmen	13	31	.....	20	11	.....	.....
Stockers	12	101	13	68	20	.....	.....
Take-offs	8	69	8	30	31	.....	.....
Unclassified	19	169	3	88	75	.....	3
Total, all occupations	19	1,915	89	967	791	.....	68

The customary working time per week was 5 and 6 days, alternately, for 50.50 of the 1,915 employees in the Garrett rod mills. Almost all of the other employees worked 6 days or turns per week, though there were about an equal number working 5 days and 7 days per week. The table which follows shows the per cent of employees in the principal occupations in Garrett rod mills. The occupations are shown in the order of the processes of manufacture customarily working each specified number of days or turns per week.

PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK—GARRETT ROD MILLS.

Occupations.	Number of plants.	Normal number of employees.	Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Stockers	12	101	12.87	67.33	19.80	.....	.....
Heaters	16	36	5.56	50.00	38.89	.....	5.56
Heaters' helpers	16	94	.....	68.09	30.85	.....	1.06
Roll engineers	19	86	6.98	46.51	39.53	.....	6.98
Rollers	14	28	3.57	71.43	17.86	.....	7.14
Rollers' assistants	15	54	5.56	51.85	42.59	.....	.....
Roughers	17	116	5.17	81.03	13.79	.....	.....
Oval roll hands	18	200	7.00	49.00	44.00	.....	.....
Diamond roll hands	17	88	.....	47.73	52.27	.....	.....
Finishers	18	66	6.06	63.64	30.30	.....	.....
Hookers	18	159	3.77	57.86	38.36	.....	.....
Other roll hands	14	78	.....	66.67	33.33	.....	.....
Reelers	18	51	7.84	54.90	37.25	.....	.....
Laborers	11	220	6.36	5.45	67.73	.....	20.45
Other occupations	.....	538	2.97	50.00	44.80	.....	2.23
Total, all occupations	19	1,918	4.65	50.50	41.31	.....	3.55

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About one-fifth of the laborers, 20.45 per cent, worked 7 days or turns a week. In the other occupations the proportion working 7 days or turns was very small. The differences between the proportion working the different number of days or turns per week in the various occupations is in a large part due to the fact that not all of the plants reported precisely the same proportion of employees in the different occupations. In the case of roughers, the wide discrepancy which exists between this occupation and the remaining number of the rolling crew is to be explained by the fact that the mills which were operating 6 days or turns per week employed a continuous train for roughing.

The table which follows shows for each of the principal districts the number and per. cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY PRINCIPAL DISTRICTS—GARRETT ROD MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Eastern	3	250	74	160	16	.....	.....	29.60	64.00	6.40	.....	.....
Pittsburgh	6	674	14	316	333	.....	11	2.08	46.88	49.41	.....	1.63
Great Lakes and Middle West	8	862	1	446	378	.....	37	.12	51.74	43.85	.....	4.29
Total, all districts	19	1,915	89	967	791	.....	68	4.65	50.50	41.31	.....	3.55

TUBE MILLS.

INTRODUCTION.

The data relative to earnings and hours of work are summarized briefly in the pages immediately following and analyzed in more detail on pages 322 to 334.

SUMMARY OF EARNINGS AND HOURS AND DAYS OF WORK.

EARNINGS.

Data relative to earnings in tube mills were reported for 4,095 employees in special iron and steel occupations in 12 plants.

Of all the employees 82.59 per cent were in the Pittsburgh district. The data are not reported separately for the other districts on account of the small number involved.

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Of the 4,095 employees included in this report on tube mills, 40.24 per cent earned 16 and under 18 cents per hour; 21.17 per cent earned 20 and under 25 cents per hour; and 18.02 per cent earned 18 and under 20 cents per hour. The average earnings per hour for the 4,095 employees were 20.5 cents.

The per cent of employees earning each classified amount per hour for the Pittsburgh district and for all districts is shown in the table which follows:

PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR IN THE PITTSBURGH DISTRICT AND IN ALL DISTRICTS—TUBE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.							
			Under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 cents and over.
Pittsburgh	3,382	$0.204	6.51	43.32	18.57	20.25	3.87	3.81	1.51	2.16
Total, all districts	4,095	.205	8.94	40.24	18.02	21.17	3.74	4.13	1.44	2.32

The summary in the form of cumulative percentages, which follows, shows that nearly one-half, 49.18 per cent, of all employees earned less than 18 cents per hour, and that over two-thirds, 67.20 per cent, earned less than 20 cents per hour.

This table shows number and per cent of employees earning less than each specified amount per hour for the Pittsburgh district, and also for all districts. The other districts are omitted, owing to the comparatively small number of employees represented. The Pittsburgh district forms such a large percentage of the total that the figures for that district practically parallel the figures for all districts combined.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR IN PITTSBURGH DISTRICT AND IN ALL DISTRICTS—TUBE MILLS.

Earnings per hour.	Pittsburgh district.		Total all districts.	
	Number of employees.	Per cent of total number of employees.	Number of employees.	Per cent of total number of employees.
Under 16 cents	220	6.51	366	8.94
Under 18 cents	1,685	49.83	2,014	49.18
Under 20 cents	2,313	68.40	2,752	67.20
Under 25 cents	2,998	88.65	3,619	88.37
Under 30 cents	3,129	92.52	3,772	92.11
Under 40 cents	3,258	96.33	3,941	96.24
Under 50 cents	3,309	97.84	4,000	97.68

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HOURS OF LABOR.

The average customary working hours per week were reported for 4,095 employees in the special iron and steel occupations in 12 tube mill plants. Eight of the 12 plants reporting were in the Pittsburgh district, and owing to the small number of plants reporting from each of the other districts those districts are not shown in detail, but are included in the total for all districts.

Sixty hours per week was the customary working time for 60.85 per cent of all employees, and over 60 and under 72 hours per week was the customary working time for 31.04 per cent of all employees. The average hours in the Pittsburgh district were slightly higher than the total for all districts.

The per cent of employees customarily working each classified number of hours per week for the Pittsburgh district and for all districts are shown in the following table:

PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK IN THE PITTSBURGH DISTRICT AND IN ALL DISTRICTS—TUBE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—			
			56 and under 60.	60.	Over 60 and under 72.	72 and over.
Pittsburgh	3,382	62.3	7.24	56.03	34.39	2.34
Total, all districts	4,095	62.0	5.98	60.85	31.04	2.12

Of all employees 5.98 per cent customarily worked less than 60 hours per week, and 7.24 per cent of the employees in the Pittsburgh district customarily worked less than 60 hours per week. Over 60 hours per week was the customary working time for 33.16 per cent of the employees in all districts and for 36.73 per cent of all employees in the Pittsburgh district.

DAYS PER WEEK.

The customary working time for 65.71 per cent of all employees was 5 and 6 days or turns per week, alternating, and 33.24 per cent customarily worked 6 days or turns per week. Less than 1 per cent of the employees in the special iron and steel occupations in the tube mills customarily worked 7 days or turns per week.

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GENERAL DESCRIPTION OF EQUIPMENT AND METHOD OF OPERATION.

Welded pipe is made from specially rolled plates of wrought iron or steel known as "skelp," which are a little more than three times as wide as the diameter of the finished pipe and a foot or two longer than the greatest length of pipe desired. It is essential that this skelp shall be of the same width and have perfectly even edges throughout its entire length, a result which is obtained in the case of narrow skelp by rolling it either in a universal mill or in one with clean-cut grooves of the desired width in the rolls, and in the case of very wide plates by rolling it in a universal mill or in a sheared plate mill and in the latter case trimming the edges.

The welding may be done by either of two processes, "butt welding" or "lap welding," depending chiefly upon the size of the pipe, but also on the quality desired. Butt welding does not produce so strong a pipe as lap welding, and is, moreover, generally restricted to pipe less than 3 inches in diameter. It is much cheaper, however, and is employed for practically all the small gas and water pipes used at the present time. Great changes and improvements have taken place in the past few years, and there consequently are wide differences in detail in the processes at different plants. In the brief description which follows no attempt will be made to do more than indicate what may be considered standard practice at the present time. The description for the tube mills has, however, been made somewhat more detailed than for some of the other branches of the iron and steel industry, because reasonably complete articles on tube making are very difficult to find. A slightly different method of description from that used in the other branches has been used here because the functions of the occupations are so much a part of the processes that they must necessarily be considered together. The finishing and testing departments have not been included.

Butt welding, sometimes known as bell welding, consists essentially in drawing skelp at a welding heat through a bell-shaped die (the bell), the inner diameter of which is just enough smaller than the outside of the finished pipe to force the edges of the skelp squarely together and cause them to weld.

The equipment of a butt welding department consists of, first, a long, flat-bottomed furnace for heating the skelp and capable of containing a large number of pieces laid side by side; second, a long bench (the "drawbench" or "moving bench") at the drawing end of the furnace, mounted so that it can be moved backward and forward along the drawing end of the furnace and get skelp from any part of it; third, a set of grooved sizing rolls; fourth, a set of "cross rolls" or "straightening rolls;" fifth, a "hotbed" or cooling rack for the pipes. In addition there is the necessary equipment of "bells," which may best

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be described as short tubes flared at one end; special "tongs" for drawing the skelp from the furnace and through the bell, and "hooks" for hooking the tongs to the endless chain which furnishes the power by which the skelp is drawn through the bell.

The process is continuous, but may be considered as consisting of three steps—heating, welding, and sizing and straightening. The skelp for butt welding is specially prepared by having the corners of the forward end sheared off to form a V-shape and both ends bent up slightly to make the skelp slide more easily and to make it easy for the welder to fasten his tongs. The skelp in this form is charged V-shaped end first, the pieces being placed side by side in the furnace, where it is quickly heated. When it is properly heated, the welder at the drawing end of the furnace snaps a pair of tongs over the narrow end of the skelp, and passes a sleeve over the lever ends of the tongs, which clamps them tightly together. The tongs are then slipped through a bell, which is dropped into a countersunk hole in a fixed "headblock" at the end of the "drawbench," directly in line with the endless motor-driven chain which passes over sprockets at either end of the bench. The narrow end of the bell presses against the back of the "headblock," the tongs passing through the bell and thence through a notch in the block. The "hook runner" now places over a shoulder on the end of the tongs a special grip, shaped like two bent fingers, which form one end of the "hook." The other end of the "hook," which is a genuine hook, is engaged in one of the links of the rapidly moving chain, which draws the skelp at a rapid rate through the bell, where the edges are bent together as they enter the flared end and tightly welded before they leave the narrow end. The "hook runner" holds the hook in place on the chain, and is pulled forward by the force of the chain, his feet sliding along the floor until he reaches the other end of the bench, or until the skelp has been drawn entirely through the bell and is welded. The "hook runner" now releases his hook from both the tongs and the chain and returns to repeat the operation. The tongs are released by a special employee designated as "take-off tongs," and are returned to the furnace by being slid down a chute. The "drawbench operator" now causes the bench to move slightly to one side until it is opposite the next piece of skelp, and the same process is repeated until the bench has been moved entirely across the furnace, at which time the skelp at the other side of the furnace is heated and the bench is returned.

After the tongs have been disengaged the welded pipe is rolled down an incline by a "take-off" and delivered into a trough with small rollers at the bottom and is carried to the "size rolls," where it is taken charge of by the "size roller" who, grasping the leading end with a pair of tongs, thrusts it into the circular "pass" between the

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rolls. This "pass" or hole between the two rolls is formed by a semicircular groove cut in the surface of each roll and is just the size of the finished pipe, so that as the pipe passes through any minor inaccuracies in the still hot pipe are corrected.

The pipe now drops into another conveyer trough and is carried on to the "cross rolls" or "straightening rolls," where it rests on top of and between the rolls. These cross rolls consist of a pair of concave rolls; that is, the diameter at each end is greater than at the center, there being a gently curved taper from either end toward the middle point of each roll. The axes of the rolls are set at an accurate angle, crossing each other at the middle point to form an X. They are revolved in the same direction and consequently cause the pipe to rotate rapidly and at the same time move forward slowly, any single point in the pipe by this motion being made to describe a spiral. This motion tends to straighten the pipe in much the same way that one straightens a cigarette by rolling it diagonally between the palms. There is an employee, the "cross roller," at these rolls who sees that the pipe enters properly and who usually operates a trough which conveys the pipe to the cooling racks, where the "straighteners" turn it over to keep it straight. It finally passes to a set of gang saws which cuts it into lengths. The ends are next finished and threaded and the pipe tested, but with these operations we have no concern at present.

The equipment for producing lap welded pipe consists of, first, a "bending furnace," similar to the furnace described in connection with butt welding, together with a special die or machine for bending and overlapping the edges of the skelp. Second, the welding furnace, in which the skelp can be raised to a welding heat, with a pair of specially grooved welding rolls at one end and some means for holding a projectile-shaped mandrel or "ball" between the rolls. The rest of the essential equipment is the same as that already described for "butt welding."

The skelp is charged into the bending furnace by a charging machine which moves back and forth across the end of the furnace and which has a long pusher arm by which the skelp is pushed into the furnace. After the skelp reaches a welding heat it is pushed through the furnace until grasped by the scarfing rolls, either by a hand tool called a picker or by the next piece of skelp pushed in by the charging machine. The scarfing rolls bevel the edges of the skelp so that the "lap" of the finished tube is not thicker than the rest of the wall. The skelp is now ready for bending. In the case of large pipes this bending is done by passing the skelp sidewise into a special machine, which consists of two lower rolls set parallel and very close to each other, with a third roll mounted so that it rests in the depression between them, and arranged so that it can be raised or lowered by means of a lever. One side of the skelp being inserted

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between the upper and the two lower rolls, it is rolled back and forth until it is formed into a cylinder with the edges overlapping, very much as one rolls a cigarette between the fingers. The narrower skelp is formed into a similar cylinder by being drawn through a die, which differs from the "bell" used in butt welding in that it is longer and is arranged so that the skelp enters flat and is gradually curved, the two sides of the die being specially shaped so as to make the edges overlap as they reach the cylindrical part of the die. At this point a specially shaped mandrel a little smaller than the inner diameter of the tube is suspended so that its forward end is inside the skelp and presses against it, assuring that the skelp will assume a true cylindrical form preventing the overlapped edge from turning in too far.

The skelp is drawn through this die by means of tongs, with jaws specially shaped so that when a hook at the other end of the tongs is attached to an endless chain similar to that used in butt welding the strain causes the jaws to grip the skelp tighter and tighter.

After the skelp has been bent into the cylindrical form by either of the methods described above, it is charged into the welding furnace by a special charging machine known as a pusher. In the hearth of the welding furnace is a gutter or trough which is directly in line with the opening in the furnace wall which leads to the welding rolls. As soon as one of the cylindrical pieces of skelp is heated to a welding temperature, it is rolled over into the gutter, and is then pushed out through the opening of the furnace and into the circular hole between the welding rolls. In the meantime a long bar carrying on its end a projectile-shaped mandrel or "ball" (a little larger than the inside of the finished pipe is to be) has been pushed into the hole between the rolls from the other side, so that as the cylinder of skelp enters the rolls, the "ball" is inside it and holding it firmly against the pressure of the rolls and the ball causes the overlapping edges of the skelp to form a weld or seam extending the whole length of the pipe.

The bar, which is of course inside the pipe as it issues from the rolls, is now pulled back and out of the pipe, the ball falling from the end of the bar. Sometimes the pipe is rolled over a mandrel in a second pair of rolls, which are chilled in order to make sure that the weld is perfect, but generally it passes directly into the sizing rolls and then into the cross rolls, both of which are similar to those described for butt welding, but of larger size. It is then cooled, sawed, and finished.

DESCRIPTION OF OCCUPATIONS.

In the following description of occupations the main occupation name shown represents the term retained in the report under which data as to wages and hours of labor are presented. The names shown in parenthesis represent the most important minor occupations

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included under the name used in this report, as well as other terms used in various establishments to indicate the same class of work. In the first paragraph, "Duties," is given a description of the functions which employees in the occupation perform and the method by which the work is done. In the second paragraph, "Nature of work," two points are covered—first, an indication of the type of workman required for the position, and, second, the conditions under which the work is done. The occupations are presented in the order of the processes of manufacture.

CHARGERS.

DUTIES.—Operate levers controlling the action of a charging machine by which the skelp is placed in the furnace.

NATURE OF WORK.—Hot, but fairly light work.

PICKERS.

DUTIES.—With long bars forked at the end arrange the skelp in butt welding furnaces and push the pieces within reach of the butt welders.

NATURE OF WORK.—Relatively unskilled work, demanding little experience. The position is a very hot one, and the men are frequently spelled.

BUTT WELDERS.

DUTIES.—Clamp tongs to the end of the skelp and put the "bell" or die in place through which the skelp is drawn in welding.

NATURE OF WORK.—Very hot work, requiring constant attention while on duty. These men are usually spelled.

DRAWBENCH OPERATORS.

(Including Bench Movers; Moving-Bench Boys.)

DUTIES.—Operate levers controlling mechanism by which the drawbench is carried back and forth across the end of the furnace.

NATURE OF WORK.—Light, comparatively unskilled work, requiring little training.

HOOK RUNNERS.

DUTIES.—Handle the specially shaped hook by which the tongs are attached to the endless chain of the drawbench. As the chain moves forward the boy slides along with it to hold the hook in place until the skelp is entirely drawn through the bell.

NATURE OF WORK.—Light, but very exhausting work, unless relieved by spell hands. The work is commonly performed by boys in preference to men, both because of their lower rate and their greater agility.

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TAKE-OFF TONGS.

DUTIES.—Remove the tongs from the welded pipe and return them to the welders by means of chutes.

NATURE OF WORK.—Light, comparatively unskilled work.

BENDERS.

DUTIES.—In lap-welding plants have charge of the bending furnace and of the bending processes generally. Where large skelp is bent, operate the rolls of the bending machine, and on small skelp attach the tongs by which the skelp is drawn through the die. Also operate levers controlling the scarfing rolls.

NATURE OF WORK.—Very hot, hard work, particularly where the skelp is formed by being drawn through dies. Considerable skill is required in handling the bending rolls.

BENDERS' HELPERS.

(Including Sledgers.)

DUTIES.—Bend the end of the skelp down with a sledge so that the bender can attach the tongs more easily. Where bending is done on rolls, they assist the bender in handling the skelp and hammer down the overlapping edges with sledges when necessary.

NATURE OF WORK.—Hot, heavy work, requiring no very large amount of skill.

TONG RUNNERS.

DUTIES.—Hook tongs to endless chain by which the skelp is drawn through the forming die.

NATURE OF WORK.—Hot, continuous work unless spell hands are provided. Very much like that of the hook runner.

ROLLERS OFF.

DUTIES.—A term used to cover employees who roll the pipes down inclines from one step in the process to the next. The majority of those included here transfer the skelp from the bending to the welding furnace.

NATURE OF WORK.—Hot, but relatively unskilled work.

PUSHERS.

DUTIES.—Operate levers controlling the movements of a machine and its charging bar, by which bent skelp is put into and pushed out of the welding furnace.

NATURE OF WORK.—This is a hot, but not very heavy work. Is sometimes spelled by one of the other pit hands.

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TURNDOWNS.

DUTIES.—Roll the bent skelp across the hearth of the furnace and into the gutter from which it is pushed into the welding rolls. Must be careful to see that the overlapping edges of the skelp are kept at the top of the pipe, to prevent premature welding. In handling the skelp use a long-handled fork or picker.

NATURE OF WORK.—Extremely hot work and requiring some little experience.

LAP WELDERS.

DUTIES.—In general charge of the welding furnace. The specific duty is to judge when the skelp is at a welding heat and then to see that it is pushed out properly into the welding rolls. In doing this the tines of a long-handled fork is placed over the edge of the skelp and the end of the handle is then laid in a notch in the bar of the charging machine, which moves forward shoving the skelp out at the other end into the welding rolls.

NATURE OF WORK.—The most highly skilled and responsible position in tube-mill work. The judgment of the proper welding heat for the pipe upon which the entire success of the operation depends, is made entirely with the eye. This knowledge can be acquired only by long experience. The work is very hot.

BALLERS.

(Including Ball Men.)

DUTIES.—Fit the socket in the rear end of the ball or mandrel over the end of the bar by which it is held in place between the rollers.

NATURE OF WORK.—Heavy, but comparatively unskilled work. In plants which have not given attention to preventing high temperatures in working places, this work is very hot.

BAR PULLERS.

(Including Bar Operators.)

DUTIES.—Operate levers controlling the bar which supports the ball. After a pipe is welded the bar is withdrawn from the pipe and returned to the rolls to have another ball put in place.

NATURE OF WORK.—Light work requiring considerable experience and constant attention.

TAKE-OFFS AND SIZE ROLLERS.

DUTIES.—Roll the welded pipe down an incline and enter the end into a set of size rolls. In many establishments these two operations are performed by different men.

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NATURE OF WORK.—Hot, fairly heavy work, requiring considerable skill and experience, as the rolls have to be frequently readjusted.

CROSS ROLLERS.

DUTIES.—Guide pipe from sizing rolls to cross rolls.

NATURE OF WORK.—Comparatively unskilled work, requiring constant attention chiefly.

STRAIGHTENERS.

DUTIES.—Operate a machine for removing any bends in the pipe. The chief duty is to handle the pipe.

NATURE OF WORK.—Light, comparatively unskilled work.

SAW MEN.

DUTIES.—Operate levers controlling saws which cut the pipe into proper lengths; also handle pipes for the saws.

NATURE OF WORK.—Relatively unskilled work. The men are, however, exposed, unless properly protected, to sparks and flying bits of metal.

PATCHERS AND STICKER DRESSERS.

DUTIES.—Repair slight defects on pipe, and remove the ball in case it sticks in a pipe while welding. It is usually necessary to cut the ball out.

NATURE OF WORK.—Patching is light work, but requiring some skill and experience. Sticker dressing is heavy, hot work.

BALL AND BELL GAUGERS.

DUTIES.—Measure the diameters of balls and bells to make sure that the pipe will be of the proper size. In some cases these men also do the grinding.

NATURE OF WORK.—Light work, but requires considerable experience.

CRANEMEN.

DUTIES.—Operate cranes, chiefly electric cranes of moderate capacity, used in handling skelp and pipe.

NATURE OF WORK.—Light work, but requiring considerable experience. Much of the work is done by boys between 16 and 20 years of age.

FURNACE MEN.

DUTIES.—Assist the welders and benders in maintaining proper temperature in their furnaces. Their principal duty is to clean up around the furnaces.

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NATURE OF WORK.—Light, comparatively unskilled work, requiring some exposure to heat.

LABORERS.

DUTIES.—Perform various duties. The unskilled jobs mentioned above are in many plants not given a separate name but simply credited to laborers.

NATURE OF WORK.—Unskilled work, chiefly light, although some of it is done under conditions of considerable heat.

MOTOR OPERATORS.

DUTIES.—Operate levers controlling motors for trough conveyers and many miscellaneous transfer devices required by local arrangements.

NATURE OF WORK.—Light work, largely done by boys.

ROLL SETTERS AND HELPERS.

DUTIES.—Set and adjust the welding, size, and cross rolls in very much the same way as in rolling mills (p. 148).

NATURE OF WORK.—The work is intermittent in character, there usually being considerable periods of leisure. The work requires considerable experience and mechanical ability.

UNCLASSIFIED.

DUTIES.—Includes a large number of occupations in which the duties varied so that they could not be included with any of the groups shown above. Also includes a number of local names which could not be identified, and a number of occupations in which the numbers were too small to be shown separately.

NATURE OF WORK.—The character of the work varies widely. This group includes all the boys who have not been reported under the occupations above.

EARNINGS AND HOURS AND DAYS OF WORK, BY OCCUPATIONS.

EARNINGS PER HOUR.

Data relative to earnings per hour for each occupation are shown in detail, in Table I, at the end of this volume and for each occupation and each district in Table II. Table I shows for each plant separately customary number of working days per week, customary number of working hours per day, normal number of employees, average earnings per hour, and number of employees earning each classified amount per hour. Table II shows for each occupation and each district the number of plants reporting data, the number of employees included, and the average earnings per hour. The table

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is so arranged that a comparison is easily made of the earnings of time workers and of tonnage workers in the different occupations within each of the districts and also of the earnings of each of the two classes of workers in the several districts.

The tables here presented summarize the information concerning earnings. The table which follows is a summary of Table II with the exception that time workers and tonnage workers are not shown separately but are combined. The data are shown separately only for the Pittsburgh district, as the number of employees in the other districts is too small to admit of comparison.

AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED) IN THE PITTSBURGH DISTRICT AND IN ALL DISTRICTS—TUBE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Occupations.	Pittsburgh district.	Total, all districts.
Ballers:		
Plants	7	10
Employees	69	85
Average earnings per hour.....cents.	18.2	18.2
Ball and bell gaugers:		
Plants	7	9
Employees	38	42
Average earnings per hour.....cents.	19.4	19.3
Bar pullers:		
Plants	7	10
Employees	61	81
Average earnings per hour.....cents.	21.4	21.3
Benders:		
Plants	7	10
Employees	63	81
Average earnings per hour.....cents.	28.0	28.3
Benders' helpers:		
Plants	4	6
Employees	38	48
Average earnings per hour.....cents.	19.2	18.8
Chargers:		
Plants	7	11
Employees	213	279
Average earnings per hour.....cents.	19.3	19.0
Cranemen:		
Plants	6	7
Employees	79	85
Average earnings per hour.....cents.	21.7	21.7
Cross rollers:		
Plants	6	9
Employees	83	107
Average earnings per hour.....cents.	17.1	17.3
Drawbench operators:		
Plants	5	7
Employees	36	44
Average earnings per hour.....cents.	14.6	14.8
Furnace men:		
Plants	5	7
Employees	47	59
Average earnings per hour.....cents.	18.9	19.1
Hook runners:		
Plants	5	7
Employees	94	118
Average earnings per hour.....cents.	17.3	17.1
Laborers:		
Plants	8	12
Employees	1,121	1,260
Average earnings per hour.....cents.	16.8	16.7
Motor operators:		
Plants	5	6
Employees	47	75
Average earnings per hour.....cents.	18.9	17.9
Patchers and sticker dressers:		
Plants	6	9
Employees	92	112
Average earnings per hour.....cents.	18.6	18.7

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AVERAGE HOURLY EARNINGS IN EACH OCCUPATION (TIME WORKERS AND TONNAGE WORKERS COMBINED) IN THE PITTSBURGH DISTRICT AND IN ALL DISTRICTS—TUBE MILLS—Concluded

Occupations.	Pittsburgh district.	Total, all districts.
Pickers:		
Plants	3	5
Employees	48	62
Average earnings per hour.....cents..	20.9	21.0
Pit hands:		
Plants	7	9
Employees	170	208
Average earnings per hour.....cents..	21.2	21.3
Pushers:		
Plants	6	8
Employees	45	57
Average earnings per hour.....cents..	22.1	21.9
Rollers off:		
Plants	6	8
Employees	81	91
Average earnings per hour.....cents..	16.7	16.7
Roll setters:		
Plants	7	10
Employees	58	74
Average earnings per hour.....cents..	29.9	29.9
Roll setters' helpers:		
Plants	5	8
Employees	36	44
Average earnings per hour.....cents..	21.4	21.1
Saw men:		
Plants	4	6
Employees	55	61
Average earnings per hour.....cents..	21.1	20.5
Straighteners:		
Plants	6	7
Employees	46	54
Average earnings per hour.....cents..	19.9	19.9
Take-offs and size rollers:		
Plants	7	10
Employees	122	148
Average earnings per hour.....cents..	19.8	19.9
Take-off tongs:		
Plants	5	7
Employees	32	40
Average earnings per hour.....cents..	17.0	17.3
Tong runners:		
Plants	5	8
Employees	34	52
Average earnings per hour.....cents..	16.9	17.6
Turndowns:		
Plants	8	11
Employees	124	148
Average earnings per hour.....cents..	28.5	28.5
Welders, butt:		
Plants	6	8
Employees	75	95
Average earnings per hour.....cents..	45.7	45.3
Welders, lap:		
Plants	8	11
Employees	67	85
Average earnings per hour.....cents..	57.9	58.0
Unclassified:		
Plants	8	12
Employees	308	400
Average earnings per hour.....cents..	18.4	18.4

Eight of the 12 plants reporting and 82.59 per cent of the employees in the tube mills were in the Pittsburgh district. For this reason this district alone is shown in detail, but the other smaller districts are included in the totals.

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The next table compares the earnings of time workers and tonnage workers. This comparison is of little importance for tube mills on account of the very small number of employees paid on the tonnage basis. Only the more highly skilled employees in one single plant in tube mills were reported as being paid on the tonnage basis and in these few cases they uniformly showed higher average earnings per hour than the time workers, with the single exception of the lap welders, where the difference is slightly in favor of the time workers.

COMPARISON OF AVERAGE EARNINGS PER HOUR OF TIME WORKERS AND OF TONNAGE WORKERS, BY OCCUPATIONS—TUBE MILLS.

Occupations.	Time.			Tonnage.			Time and tonnage combined.		
	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.	Number of plants.	Normal number of employees.	Average rate per hour.
Ballers	10	85	$0.182	.....	.....	.....	10	85	$0.182
Ball and bell gaugers	9	42	.193	.....	.....	.....	9	42	.193
Bar pullers	10	81	.213	.....	.....	.....	10	81	.213
Benders	10	77	.283	1	4	.292	10	81	.283
Benders' helpers	6	48	.188	.....	.....	.....	6	48	.188
Chargers	11	275	.189	1	4	.253	11	279	.190
Cranemen	7	85	.217	.....	.....	.....	7	85	.217
Cross rollers	9	107	.173	.....	.....	.....	9	107	.173
Drawbench operators	7	44	.148	.....	.....	.....	7	44	.148
Furnace men	7	59	.191	.....	.....	.....	7	59	.191
Hook runners	7	118	.171	.....	.....	.....	7	118	.171
Laborers	12	1,260	.167	.....	.....	.....	12	1,260	.167
Motor operators	6	75	.179	.....	.....	.....	6	75	.179
Patchers and sticker dressers	9	112	.187	.....	.....	.....	9	112	.187
Pickers	5	62	.210	.....	.....	.....	5	62	.210
Pit hands	9	208	.213	.....	.....	.....	9	208	.213
Pushers	8	53	.211	1	4	.315	8	57	.219
Rollers off	8	91	.167	.....	.....	.....	8	91	.167
Roll setters	10	68	.297	1	6	.317	10	74	.299
Roll setters' helpers	8	44	.211	.....	.....	.....	8	44	.211
Saw men	6	61	.205	.....	.....	.....	6	61	.205
Straighteners	7	54	.199	.....	.....	.....	7	54	.199
Take-offs and size rollers	10	148	.199	.....	.....	.....	10	148	.199
Take-off tongs	7	40	.173	.....	.....	.....	7	40	.173
Tong runners	8	52	.176	.....	.....	.....	8	52	.176
Turndowns	11	136	.284	1	12	.303	11	148	.285
Welders, butt	8	91	.443	1	4	.635	8	95	.453
Welders, lap	11	77	.586	1	8	.531	11	85	.580
Unclassified	12	400	.184	.....	.....	.....	12	400	.184

The next table shows, for each of the principal occupations, average earnings per hour and the per cent of employees earning each classified amount per hour. The occupations are in order following the processes of manufacture.

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PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS—TUBE MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Chargers	11	279	$0.190	.....	.....	5.02	11.47	55.56	26.52	1.43	.....	.....	.....	.....	.....
Butt welding:															
Welders	8	95	.453	.....	.....	.....	.....	.....	5.26	2.11	9.47	60.00	18.94	4.21	.....
Hook runners	7	118	.171	.....	5.08	.....	94.92	.....	.....	.....	.....	.....	.....	.....	.....
Lap welding:															
Welders	11	85	.580	.....	.....	.....	.....	.....	.....	.....	11.76	2.35	22.35	62.35	1.18
Turndowns	11	148	.285	.....	.....	.....	.....	.....	10.81	38.51	50.68	.....	.....	.....	.....
Ballers	10	85	.182	.....	.....	4.71	23.53	55.29	16.47	.....	.....	.....	.....	.....	.....
Bar pullers	10	81	.213	.....	.....	.....	7.41	11.11	81.48	.....	.....	.....	.....	.....	.....
Roll setters	10	74	.299	.....	.....	.....	.....	.....	2.70	37.84	59.46	.....	.....	.....	.....
Take-offs and size rollers	10	148	.199	.....	.....	.....	43.24	8.78	47.97	.....	.....	.....	.....	.....	.....
Cross rollers	9	107	.173	.....	.....	18.69	52.34	25.23	3.74	.....	.....	.....	.....	.....	.....
Laborers	12	1,260	.167	0.63	1.83	8.73	85.40	3.41	.....	.....	.....	.....	.....	.....	.....
Other occupations	.....	1,615	.197	2.54	2.79	5.88	17.46	27.49	38.08	3.84	1.92	.....	.....	.....	.....
Total all occupations	12	4,095	.205	1.20	1.81	5.93	40.24	18.02	21.17	3.74	4.13	1.44	.90	1.39	.02

In the above table the striking differences, both in the average rate and in the classified amount earned per hour by the different occupations are shown. The most highly paid employees are the welders. The welders in butt welding receive average earnings per hour of 45.3 cents, and the welders in lap welding receive average earnings per hour of 58 cents. None of the lap welders receive less than 30 cents per hour, although 7.37 per cent of the butt welders receive less than this amount. On the other hand, 62.35 per cent of the lap welders receive 60 and under 70 cents per hour, while the largest proportion of the butt welders receive 40 and under 50 cents per hour. None of the other employees receive anything like as high a rate per hour as these two occupations, and it should be noted in considering these more highly paid occupations that they include only about 4 per cent of the total employees. This fact is made very evident when it is noted that only 2.31 per cent of the total employees in this department receive more than 50 cents per hour.

The next summary shows for the Pittsburgh district and for all districts the number of plants reporting, the normal number of employees, the average earnings per hour, and the number of employees earning each classified amount per hour. Time workers and tonnage workers are shown separately, and the two classes are also combined.

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NUMBER OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, AND AVERAGE HOURLY EARNINGS IN THE PITTSBURGH DISTRICT AND IN ALL DISTRICTS—TUBE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Number of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
TIME WORKERS.															
Pittsburgh	8	3,340	$0.202	31	42	147	1,465	628	685	117	111	51	21	42	.....
Total, all districts	12	4,053	.203	49	74	243	1,648	738	867	139	151	59	33	51	1
TONNAGE WORKERS.															
Pittsburgh	1	42	.377	.....	.....	.....	.....	.....	.....	14	18	.....	4	6	.....
Total, all districts	1	42	.377	.....	.....	.....	.....	.....	.....	14	18	.....	4	6	.....
TIME AND TONNAGE WORKERS.															
Pittsburgh	8	3,382	.204	31	42	147	1,465	628	685	131	129	51	25	48	.....
Total, all districts	12	4,095	.205	49	74	243	1,648	738	867	153	169	59	37	57	1

The average hourly earnings for the 4,095 employees in tube mills was 20.5 cents per hour. This is the lowest average rate per hour paid in any department of the iron and steel industry, except blast furnaces, in spite of the fact that the larger proportion of the tube mills are in the Pittsburgh district, which, as a rule, shows a relatively higher level of wages than in the other important districts. As a matter of fact, the Pittsburgh district in this case, it may be noted, reports an average hourly earning of 20.4 cents, which is very much lower than in any of the other departments in this district, with the single exception of blast furnaces. The very low level of wages paid in this department, it will be seen by referring to the tables in which occupations are shown separately, arises from the fact that a large proportion of unskilled laborers are utilized in the tube mills. The time workers earn a considerably lower average amount per hour than the tonnage workers, but the number of tonnage workers reported is so small that this fact merits little consideration.

The table which follows shows the per cent of employees earning each classified amount per hour. These percentages are computed from the third section of the total immediately preceding, in which time workers and tonnage workers are combined.

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PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR AND AVERAGE HOURLY EARNINGS IN THE PITTSBURGH DISTRICT AND IN ALL DISTRICTS—TUBE MILLS.

[Data are not shown separately or districts in which only 1 plant reported but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average earnings per hour.	Per cent of employees earning each classified amount per hour.											
				Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Pittsburgh	8	3,382	$0.204	0.92	1.24	4.35	43.32	18.57	20.25	3.87	3.81	1.51	0.74	1.42	.....
Total, all districts	12	4,095	.205	1.20	1.81	5.93	40.24	18.02	21.17	3.74	4.13	1.44	.90	1.39	0.02

From the above table it is seen that 40.24 per cent of the total number of employees earned 16 and under 18 cents per hour, while 58.26 per cent earned 16 and under 20 cents per hour.

The summary in the form of cumulative percentages, which follows, shows that practically two-thirds, 67.20 per cent, of the total number of employees earned less than 20 cents per hour and that 88.38 per cent earned less than 25 cents per hour.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR IN PITTSBURGH DISTRICT AND IN ALL DISTRICTS—TUBE MILLS.

Earnings per hour.	Pittsburgh district.		Total, all districts.	
	Number of employees.	Per cent of total number of employees.	Number of employees.	Per cent of total number of employees.
Under 16 cents	220	6.51	366	8.94
Under 18 cents	1,685	49.83	2,014	49.18
Under 20 cents	2,313	68.40	2,752	67.20
Under 25 cents	2,998	88.65	3,619	88.37
Under 30 cents	3,129	92.52	3,772	92.11
Under 40 cents	3,258	96.33	3,941	96.24
Under 50 cents	3,309	97.84	4,000	97.68

Such a large proportion of the employees were reported in the Pittsburgh district that it dominates the proportion shown for the total of all districts. For this reason, therefore, no comments are necessary on the distribution of employees in the Pittsburgh district, as it shows essentially the same conditions as for the total of all districts.

Considering all employees, both time and tonnage workers, the average earnings were, for the districts combined, 20.5 cents per hour. In the Pittsburgh district, in which 81.59 per cent of the employees were reported, the average earnings per hour were 20.4 cents.

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CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working hours per week are presented in detail for each occupation and in each establishment in Table I, at the end of this volume. These data are summarized in the text tables which follow. The first of these tables shows for each occupation the number of plants reporting, the normal number of employees, the average customary working hours per week, and the number of employees whose customary working time was each specified number of hours per week:

NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK—TUBE MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Ballers	10	85	63.1	.....	.....	10	31	42	2	.....	.....	.....
Ball and bell gaugers	9	42	61.6	.....	.....	4	25	13	.....	.....	.....	.....
Bar pullers	10	81	62.3	.....	.....	12	35	34	.....	.....	.....	.....
Benders	10	81	61.7	.....	.....	8	49	24	.....	.....	.....	.....
Benders' helpers	6	48	61.9	.....	.....	8	24	16	.....	.....	.....	.....
Chargers	11	279	61.5	.....	.....	24	175	80	.....	.....	.....	.....
Cranemen	7	85	65.4	.....	.....	.....	40	31	14	.....	.....	.....
Cross rollers	9	107	62.9	.....	.....	10	41	56	.....	.....	.....	.....
Drawbench operators	7	44	62.7	.....	.....	2	23	18	1	.....	.....	.....
Furnace men	7	59	68.8	.....	.....	8	20	15	.....	.....	6	10
Hook runners	7	118	62.0	.....	.....	6	72	40	.....	.....	.....	.....
Laborers	12	1,260	61.3	.....	.....	60	965	205	12	18	.....	.....
Motor operators	6	75	62.3	.....	.....	2	43	30	.....	.....	.....	.....
Patchers and sticker-dressers	9	112	61.4	.....	.....	27	55	30	.....	.....	.....	.....
Pickers	5	62	62.3	.....	.....	.....	38	24	.....	.....	.....	.....
Pit hands	9	208	62.9	.....	.....	2	82	124	.....	.....	.....	.....
Pushers	8	57	62.2	.....	.....	2	27	28	.....	.....	.....	.....
Rollers off	8	91	62.1	.....	.....	8	49	34	.....	.....	.....	.....
Roll settlers	10	74	61.5	.....	.....	8	54	4	8	.....	.....	.....
Roll settlers' helpers	8	44	63.3	.....	.....	.....	37	2	5	.....	.....	.....
Saw men	6	61	62.5	.....	.....	.....	36	25	.....	.....	.....	.....
Straighteners	7	54	63.3	.....	.....	.....	30	18	6	.....	.....	.....
Take-offs and size rollers	10	148	62.0	.....	.....	16	80	52	.....	.....	.....	.....
Take-off tongs	7	40	61.8	.....	.....	2	26	12	.....	.....	.....	.....
Tong runners	8	52	62.2	.....	.....	.....	32	20	.....	.....	.....	.....
Turn downs	11	148	62.4	.....	.....	.....	68	80	.....	.....	.....	.....
Welders, butt	8	95	62.0	.....	.....	.....	57	38	.....	.....	.....	.....
Welders, lap	11	85	62.9	.....	.....	2	35	48	.....	.....	.....	.....
Unclassified	12	400	61.9	.....	.....	24	243	128	5	.....	.....	.....
Total, all occupations	12	4,095	62.0	.....	.....	245	2,492	1,271	53	18	6	10

The table which follows shows for the principal occupations the per cent of employees customarily working each classified number of hours per week. The occupations are shown in the order of the processes of manufacture.

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PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK—TUBE MILLS.

Occupations.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Chargers	11	279	61.5	.....	.....	8.60	62.72	28.67	.....	.....	.....	.....
Butt welding:												
Welders	8	95	62.0	.....	.....	.....	60.00	40.00	.....	.....	.....	.....
Hook runners	7	118	62.0	.....	.....	5.08	61.02	33.90	.....	.....	.....	.....
Lap welding:												
Welders	11	85	62.9	.....	.....	2.35	41.18	56.47	.....	.....	.....	.....
Turn downs	11	148	62.4	.....	.....	.....	45.95	54.05	.....	.....	.....	.....
Ballers	10	85	63.1	.....	.....	11.76	36.47	49.41	2.35	.....	.....	.....
Bar pullers	10	81	62.3	.....	.....	14.81	43.21	41.98	.....	.....	.....	.....
Roll setters	10	74	61.5	.....	.....	10.81	72.97	5.41	10.81	.....	.....	.....
Take-offs and size rollers	10	148	62.0	.....	.....	10.81	54.05	35.14	.....	.....	.....	.....
Cross rollers	9	107	62.9	.....	.....	9.35	38.32	52.34	.....	.....	.....	.....
Laborers	12	1,260	61.3	.....	.....	4.76	76.59	16.27	.95	1.43	.....	.....
Other occupations	.....	1,615	62.5	.....	.....	6.01	54.43	36.66	1.92	.....	.37	.62
Total, all occupations	12	4,095	62.0	.....	.....	5.98	60.85	31.04	1.29	.44	0.15	0.24

The above table shows almost the same distribution for the various occupations which are reported separately, the most striking differences being in the case of laborers who show a much larger proportion working 60 hours per week than the other occupations. The average hours per week, however, for the different occupations were approximately the same, the larger proportion of laborers who work 60 hours being more than balanced in the other occupations by a considerable number who worked over 56 and under 60 hours per week. It may be noted that in none of the occupations were any of the employees reported as working less than 56 hours per week.

For each of the principal occupations included in the preceding table the per cent of employees customarily working 72 hours and over per week, and also the per cent customarily working 84 hours and over per week, are shown in more condensed form in the table which follows.

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PER CENT OF EMPLOYEES IN THE PRINCIPAL OCCUPATIONS CUSTOMARILY WORKING 72 HOURS AND OVER PER WEEK—TUBE MILLS.

Occupations.	Normal number of employees.	Per cent of employees whose customary working hours per week were—	
		72 and over.	84 and over.
Charges	279	.....	.....
Butt welding:			
Welders	95	.....	.....
Hook runners	118	.....	.....
Lap welding:			
Welders	85	.....	.....
Turndowns	148	.....	.....
Ballers	85	2.35	.....
Bar pullers	81	.....	.....
Roll setters	74	.....	.....
Take-offs and size rollers	148	.....	.....
Cross rollers	107	.....	.....
Laborers	1,260	2.38	.....
Other occupations	1,615	2.91	0.99
Total, all occupations	4,095	2.12	.39

The next table is the summary showing the customary working hours per week in the Pittsburgh district and in all districts. The time workers and tonnage workers are shown separately.

NUMBER OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK, IN THE PITTSBURGH DISTRICT AND IN ALL DISTRICTS—TUBE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Number of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under. 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
TIME WORKERS.												
Pittsburgh	8	3,340	62.3	.....	.....	231	1,895	1,135	53	14	2	10
Total, all districts	12	4,053	62.0	.....	.....	231	2,492	1,243	53	18	6	10
TONNAGE WORKERS.												
Pittsburgh	1	42	61.6	.....	.....	14	.....	28	.....	.....	.....	.....
Total, all districts	1	42	61.6	.....	.....	14	.....	28	.....	.....	.....	.....
TIME AND TONNAGE WORKERS.												
Pittsburgh	8	3,382	62.3	.....	.....	245	1,895	1,163	53	14	2	10
Total, all districts	12	4,095	62.0	.....	.....	245	2,492	1,271	53	18	6	10

The table which follows shows for the time workers and tonnage workers combined the per cent of employees customarily working each classified number of hours per week. Only the Pittsburgh district and the total for all districts are shown.

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PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK AND AVERAGE HOURS WORKED PER WEEK, IN THE PITTSBURGH DISTRICT AND IN ALL DISTRICTS—TUBE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Average customary working hours per week.	Per cent of employees whose customary working hours per week were—								
				48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84
Pittsburgh	8	3,382	62.3	.....	.....	7.24	56.03	34.39	1.57	0.41	0.06	0.30
Total, all districts	12	4,095	62.0	.....	.....	5.98	60.85	31.04	1.29	.44	.15	.24

All except 5.98 per cent of the employees worked 60 hours or more per week. Of the total employees 60.85 per cent worked 60 hours and 31.04 per cent worked more than 60 and less than 72 hours per week. The proportion working at the other combinations of hours is so small as to be negligible. The average customary working time for the 4,095 employees in tube mills was 62 hours per week.

DAYS WORKED PER WEEK.

Under each occupation the customary working days or turns per week are shown for each establishment in Table I, at the end of this volume. These data are briefly summarized here. The first table which follows shows for each occupation the number of plants reporting, the normal number of employees, and the number of employees whose customary working time was each specified number of days or turns per week.

NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH SPECIFIED NUMBER OF DAYS PER WEEK—TUBE MILLS.

Occupations.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Ballers	10	85	.....	40	45	.....	.....
Ball and bell gaugers	9	42	.....	24	18	.....	.....
Bar pullers	10	81	.....	46	35	.....	.....
Benders	10	81	.....	56	25	.....	.....
Benders' helpers	6	48	.....	32	16	.....	.....
Chargers	11	279	.....	198	81	.....	.....
Cranemen	7	85	.....	51	34	.....	.....
Cross rollers	9	107	.....	52	55	.....	.....
Drawbench operators	7	44	.....	24	20	.....	.....
Furnace men	7	59	3	19	21	.....	16
Hook runners	7	118	.....	76	42	.....	.....
Laborers	12	1,260	4	934	304	4	14
Motor operators	6	75	.....	47	28	.....	.....
Patcher and sticker dressers	9	112	.....	79	33	.....	.....

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NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK—TUBE MILLS—Concluded.

Occupations.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Pickers	5	62	.....	38	24	.....	.....
Pit hands	9	208	.....	120	88	.....	.....
Pushers	8	57	.....	40	17	.....	.....
Rollers off	8	91	.....	48	43	.....	.....
Roll setters	10	74	.....	54	20	.....	.....
Roll setters' helpers	8	44	.....	32	12	.....	.....
Saw men	6	61	.....	36	25	.....	.....
Straighteners	7	54	.....	28	26	.....	.....
Take-offs and size rollers	10	148	.....	94	54	.....	.....
Take-off tongs	7	40	.....	28	12	.....	.....
Tong runners	8	52	.....	31	21	.....	.....
Turn downs	11	148	.....	92	56	.....	.....
Welders, butts	8	95	.....	66	29	.....	.....
Welders, lap	11	85	.....	48	37	.....	.....
Unclassified	12	400	2	258	140	.....	.....
Total, all occupations	12	4,095	9	2,691	1,361	4	30

Nearly two-thirds of the employees in the tube mills, or 65.71 per cent, customarily work 5 and 6 days or turns alternately, the remainder, with the exception of less than 1 per cent, working 6 days or turns per week. The table which follows shows for each of the principal occupations the per cent of employees customarily working each specified number of days per week. The occupations are shown in the order of the processes of manufacture.

PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH SPECIFIED NUMBER OF DAYS PER WEEK—TUBE MILLS.

Occupations.	Number of plants.	Normal number of employees.	Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Chargers	11	279	.....	70.97	29.03	.....	.....
Butt welding:							
Welders	8	95	.....	69.47	30.53	.....	.....
Hook runners	7	118	.....	64.41	35.59	.....	.....
Lap welding:							
Welders	11	85	.....	56.47	43.53	.....	.....
Turndowns	11	148	.....	62.16	37.84	.....	.....
Ballers	10	85	.....	47.06	52.94	.....	.....
Bar pullers	10	81	.....	56.79	43.21	.....	.....
Roll setters	10	74	.....	72.97	27.03	.....	.....
Take-offs and size rollers	10	148	.....	63.51	36.49	.....	.....
Cross rollers	9	107	.....	48.60	51.40	.....	.....
Laborers	12	1,260	0.32	74.13	24.13	0.32	1.11
Other occupations	.....	1,615	.31	61.36	37.34	.....	.99
Total, all occupations	12	4,095	.22	65.71	33.24	.10	.73

There are no points of any special interest as regards the number of days per week worked by the separate occupations.

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The proportion of employees in the Pittsburgh district working the various combination of days was essentially the same as for the total of all districts and consequently requires no comment.

The table which follows shows for the Pittsburgh district and for all districts the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, IN THE PITTSBURGH DISTRICT AND IN ALL DISTRICTS—TUBE MILLS.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Pittsburgh.....	8	3,382	2	2,117	1,237	.....	26	0.06	62.60	36.58	.....	0.77
Total, all districts.....	12	4,095	9	2,691	1,361	4	30	.22	65.71	33.24	0.10	.73

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CHAPTER II.

EARNINGS, HOURS OF LABOR, AND DAYS WORKED IN NONPRODUCTIVE OCCUPATIONS, BY DEPARTMENTS.

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CHAPTER II.

EARNINGS, HOURS OF LABOR, AND DAYS WORKED IN NONPRODUCTIVE OCCUPATIONS, BY DEPARTMENTS.

INTRODUCTION.

Employees in nonproductive occupations are the subject of discussion in this chapter and include all those whose services are not directly required in the production of iron and steel, but whose employment is necessary in order to secure successful operation and to provide for the maintenance of the equipment in the various producing departments. These employees have been classified into two large groups:

1. Those who are attached to some particular producing department and generally work for that department alone. These employees are known in a section which follows as employees in "General occupations, producing departments."

2. Those who are not attached to any particular producing department but perform for any and all the departments such work as may be necessary. These employees have been designated as the "Power, mechanical, and yard force."

These two groups together include a total of 81,243 employees, a force which is only about 10 per cent smaller than that engaged directly in production (91,463), which has been discussed in the introductory chapter of this volume.

Of these 81,243 employees, 40,584, or 49.95 per cent, earned less than 18 cents per hour. More than three-fourths, 78.19 per cent, of the total number earned less than 25 cents per hour, and only 409, or one-half of 1 per cent, of all employees in nonproductive occupations were reported as earning as much as 50 cents per hour.

SUMMARY OF EARNINGS AND HOURS AND DAYS WORKED, BY DISTRICTS.

EARNINGS.

There were considerable variations between the different districts as regards the general level of earnings. Generally speaking, earnings were lowest in the Eastern and Southern districts and highest in the Pittsburgh, Great Lakes and Middle West and the New England districts, while the Pacific Coast district includes such a small number of employees that it is not fair to bring it into comparison with the

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other districts. The relation between the various districts, however, can be clearly understood only by a consideration of the following table, which shows the number and per cent of employees in each of the several districts earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.											
		Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
New England	1,587	7	1	260	398	182	316	276	117	15	11	4	.....
Eastern	10,256	240	1,172	2,819	1,934	821	1,444	1,160	562	87	14	1	2
Pittsburgh	40,050	443	1,653	3,684	13,585	5,860	6,320	4,066	3,749	586	70	24	10
Great Lakes and Middle West	24,052	173	116	1,485	9,186	2,711	4,399	3,049	2,499	271	95	57	11
Southern	5,198	325	1,237	1,312	552	266	574	364	432	28	95	13	.....
Pacific Coast	100	1	.....	1	.....	.....	49	31	13	3	1	1	.....
Total	81,243	1,189	4,179	9,561	25,655	9,840	13,102	8,946	7,372	990	286	100	23

PER CENT.

New England	1,587	0.44	0.06	16.38	25.08	11.47	19.91	17.39	7.37	0.95	0.69	0.25	.....
Eastern	10,256	2.34	11.43	27.49	18.86	8.01	14.08	11.31	5.48	.85	.14	.01	0.02
Pittsburgh	40,050	1.11	4.13	9.20	33.92	14.63	15.78	10.15	9.36	1.46	.17	.06	.03
Great Lakes and Middle West	24,052	.72	.48	6.17	38.19	11.27	18.29	12.68	10.39	1.13	.40	.24	.05
Southern	5,198	6.25	23.80	25.24	10.62	5.12	11.04	7.00	8.31	.54	1.83	.25	.....
Pacific Coast	100	1.00	.....	1.00	.....	.....	49.00	31.00	13.00	3.00	1.00	1.00	.....
Total	81,243	1.46	5.14	11.77	31.58	12.11	16.13	11.01	9.07	1.22	.35	.12	.03

In each of the districts there is one wage group, which is very much larger than any other group. This predominating group is made up in each case largely of the unskilled laborers who constitute a very large proportion of the entire working force of the industry. In the New England district the unskilled laborers are represented in the employees who earn 14 and less than 18 cents per hour, the greater number of whom earn 16 and under 18 cents per hour. In the Eastern district practically all the unskilled labor group is included with employees who earned 12 and under 16 cents per hour, the greater number earning 14 and under 16 cents per hour. In the Pittsburgh and Great Lakes and Middle West districts the group includes practically all those earning less than 18 cents per hour, although a small number of semiskilled workmen in some establishments were receiving somewhat less than 18 cents per hour. In the Southern district the greater number of these unskilled laborers earned less than 14 cents per hour, although a considerable number are included in the group earning 14 and under 16 cents per hour. For the small number of employees reported in the Pacific Coast dis-

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trict the standard rate for common labor was 20 cents per hour. The differences between wages in the various districts, however, were very much greater for the class of employees who earned the lowest wages than for the skilled and semiskilled employees in the various mechanical trades. For the latter, wages are much more nearly standardized throughout the country and their services in more constant demand. The relation between the different districts as regards earnings is shown more clearly in the table which follows. In this summary, which is in the form of cumulative percentages, is shown the proportion of employees in each of the districts earning less than the specified amount per hour.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS.

Districts.	Normal number of employees.	Per cent of employees whose earnings per hour were—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	1,587	0.50	16.89	41.97	53.43	73.35	90.74	98.11	99.05
Eastern	10,256	13.77	41.25	60.11	68.12	82.20	93.51	98.99	99.83
Pittsburgh	40,050	5.23	14.43	48.35	62.98	78.76	88.92	98.28	99.74
Great Lakes and Middle West	24,052	1.20	7.38	45.57	56.84	75.13	87.81	98.20	99.32
Southern	5,198	30.05	55.29	65.91	71.03	82.07	89.07	97.38	97.92
Pacific Coast	100	1.00	2.00	2.00	2.00	51.00	82.00	95.00	98.00
Total	81,243	6.61	18.38	49.95	62.07	78.19	89.20	98.28	99.50

Comparing first the two districts in which the larger number of employees were reported, it will be seen that throughout the entire range of earnings the Great Lakes and Middle West district shows a higher level of earnings than the Pittsburgh district for this class of employees. This is particularly true in the lowest groups; for example, while the Pittsburgh district shows 5.23 per cent earning less than 14 cents per hour the Great Lakes and Middle West district has only 1.20 per cent of employees in this group. The Eastern district, which has the next largest number of employees, showed a general level of earnings decidedly lower than either the Pittsburgh or the Great Lakes and Middle West district throughout the entire range of earnings. This, however, was particularly true in the groups earning less than 18 cents per hour, and although the difference was much less in the groups of employees earning the larger amounts it is, nevertheless, a decided difference. The Southern district, however, is somewhat peculiar in the fact that although for the unskilled and semiskilled employees the general level of earnings is much lower than in any other district, yet of the more highly skilled employees, a larger proportion were paid over 40 cents per hour than in any other of the principal districts. This fact will be brought out more clearly

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in the discussion of earnings in the principal occupations at a later point, but it is noted here in order to direct attention to this question, as related to the discussion of earnings in the separate departments.

CUSTOMARY WORKING HOURS PER WEEK.

The customary working hours for the employees in the nonproductive occupations were, as has been pointed out in the introductory chapter of this volume, much shorter than for the employees in the productive occupations. This difference in favor of the nonproductive occupations arises from two principal causes. In the first place, the proportion working 7 days per week is much smaller in the nonproductive occupations, where approximately one-fourth of the employees were reported as working 7 days per week, than in the productive occupations, where approximately one-third of the employees had a working week of 7 days. In the second place, while the customary working-day for employees in the productive occupations was 12 hours the continuous day and night operation of the mills and furnaces requires the continuous presence of the employees. For the employees in the productive occupations, therefore, the working-day could be made shorter than 12 hours only by the introduction of the three-shift system, on which each employee would, of course, work 8 hours per day. In the nonproductive occupations the situation is entirely different. Since a large proportion of these employees work either in the shops or in the yard, it is possible to make the working-day of practically any desired length without the serious inconvenience and expense involved in the change to the 8-hour shift. Nearly one-half of the employees in the nonproductive occupations, 48.83 per cent, customarily worked 60 hours or less per week.

Nevertheless, the working hours for this class of employees are very long when compared with those which exist in most of the other industries at the present time. The unmistakable tendency in recent years in practically all manufacturing industries has been to shorten the actual working-day to less than 10 hours, and in a great many industries at the present time the 9-hour day is generally recognized as the standard working-day. It becomes, therefore, worthy of note that in the steel industry only 3.52 per cent of the employees in the nonproductive occupations are working less than 56 hours per week, and that only 12.89 per cent have been granted a working week of less than 60 hours.

The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week:

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NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	1,587	10	41	63	1,119	169	37	52	88	8
Eastern	10,256	21	1,145	1,677	3,296	1,577	636	540	1,332	32
Pittsburgh	40,050	108	1,149	4,581	12,011	6,220	6,075	3,292	6,459	155
Great Lakes and Middle West	24,052	100	234	689	10,136	4,602	3,463	598	4,145	85
Southern	5,198	16	18	524	2,639	623	434	15	921	8
Pacific Coast	100	1	12	82	.....	2	.....	.....	3	.....
Total, all districts	81,243	256	2,599	7,616	29,201	13,193	10,645	4,497	12,948	288

PER CENT.

New England	1,587	0.63	2.58	3.97	70.51	10.65	2.33	3.28	5.55	0.50
Eastern	10,256	.20	11.16	16.35	32.14	15.38	6.20	5.27	12.99	.31
Pittsburgh	40,050	.27	2.87	11.44	29.99	15.53	15.17	8.22	16.13	.39
Great Lakes and Middle West	24,052	.42	.97	2.86	42.14	19.13	14.40	2.49	17.23	.35
Southern	5,198	.31	.35	10.08	50.77	11.99	8.35	.29	17.72	.15
Pacific Coast	100	1.00	12.00	82.00	.....	2.00	.....	.....	3.00	.....
Total, all districts	81,243	.32	3.20	9.37	35.94	16.24	13.10	5.54	15.94	.35

The wide differences as regards the customary working hours in the several districts which appear in the above table are much more largely due to the geographical situation of the various branches of the industry than to characteristics and customs prevailing in the various districts. For example, in the New England district the greater number of these establishments were comparatively small steel works and rolling mills, which operated only 6 days per week and which did not require the employment of workmen in the various nonproductive occupations for more than 10 hours a day. It is, however, perfectly proper to compare the general working hours in the Pittsburgh district with those in the Great Lakes and Middle West district because in these two districts the distribution of the various branches of the industry is very much the same. It will be seen that there is a general tendency in the Great Lakes and Middle West district to longer working hours than in the Pittsburgh district. This is particularly noticeable in comparing the proportions in the two districts reported as working less than 60 hours per week. In the Pittsburgh district 14.58 per cent of the employees had a working week of less than 60 hours as compared with 4.25 per cent in the Great Lakes and Middle West district.

DAYS WORKED PER WEEK.

For 25.39 per cent of the employees in the nonproductive occupations the customary working time per week was 7 days or turns. These employees who were working 7 days or turns per week consisted of three principal groups.

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First. The employees connected with blast furnaces and other departments which operated 7 days per week.

Second. The various workmen employed in the boiler houses and in connection with the gas producers, as well as watchmen and patrolmen. These particular occupations require practically 7 days of work per week.

Third. The various repair men whose work could most expeditiously be done on Sunday when the mills were closed down. These men were reported as customarily working 7 days per week.

For almost two-thirds of the employees in the nonproductive occupations, 66.27 per cent, the customary working time per week was 6 days or turns. The table which follows shows for each of the several districts the number and per cent of employees customarily working each specified number of days per week. It should be remembered in considering the variations between the separate districts shown in this table that these variations are largely influenced by the difference in geographical location of branches of the industry, as has been pointed out in connection with the discussion on hours just preceding, page 340. The New England and the Eastern districts show a smaller proportion working 7 days per week than either of the other principal districts. This is, however, largely due to the fact that these two districts contain a relatively small proportion of blast furnaces, in which 7-day work is customary.

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	1,587	43	71	1,314	6	153
Eastern	10,256	368	829	[1] 6,823	206	1,970
Pittsburgh	40,050	631	1,204	[2] 26,200	2,160	9,855
Great Lakes and Middle West	24,052	104	810	15,757	208	7,173
Southern	5,198	.....	70	3,650	10	1,468
Pacific Coast	100	.....	.....	95	.....	5
Total	81,243	1,146	2,984	[3] 53,839	2,650	20,624

PER CENT.

New England	1,587	2.71	4.47	82.80	0.38	9.64
Eastern	10,256	3.59	8.08	[1] 66.53	2.59	19.21
Pittsburgh	40,050	1.58	3.01	[2] 65.42	5.39	24.61
Great Lakes and Middle West	24,052	.43	3.37	65.51	.86	29.82
Southern	5,198	.....	1.35	70.22	.19	28.24
Pacific Coast	100	.....	.....	95.00	.....	5.00
Total	81,243	1.41	3.67	[3] 66.27	3.26	25.39

[1] Including 5 employees who worked 5 and 7 days alternately.
[2] Including 47 employees who worked 5 and 7 days alternately.
[3] Including 52 employees who worked 5 and 7 days alternately.

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EARNINGS, HOURS, AND DAYS OF WORK, BY OCCUPATIONS.

The facts relative to the earnings, hours, and days of work for the employees in the various nonproductive occupations can best be studied by ignoring entirely the particular department in which they work and considering only the broad occupation classification. For example, there are stationary firemen, laborers, and machinists employed in connection with practically every department of the steel plant, but it is a matter of very little significance, particularly as regards earnings, whether the firemen, for example, are employed in connection with the blast-furnace department or in the rolling mills or whether they work in the general steam-generating plant which supplies power for a number of mills. Similarly, it is of no great significance whether the machinist is working in the shops or whether he is employed in making mechanical repairs in the various departments.

In this section, therefore, a study will be made of the data relative to the earnings, hours, and days of work for each of the principal nonproductive occupations without regard to the particular department in connection with which the employee may work. For the purposes of this study of occupations twenty-one separate occupations are used. These occupations fall naturally into three groups:

First. The skilled occupations, including blacksmiths, boiler makers, bricklayers, carpenters, electricians, engineers on yard locomotives, machinists, millwrights, pipe fitters, and roll turners.

Second. The semiskilled occupations, which include the helpers to a number of occupations shown above and, in addition, oilers and wipers, and riggers.

Third. The unskilled occupations, which include stationary firemen, gasmen, and laborers.

Most of these occupations have more than 1,000 employees each. It will be seen that this list of occupations includes the larger number of the so-called mechanical trades as well as the semiskilled and unskilled occupations which are found in connection with practically all industries. This makes it possible for comparisons of the greatest significance to be made between the wages paid these employees in the iron and steel industry and in other industries. In making such a comparison, however, two highly important facts should be borne in mind. In the first place, the steel industry furnishes this class of employees very much more constant work throughout the year than can be obtained in many other industries and particularly steadier employment than can be secured in connection with outdoor construction work. As the final determinant of relative wages in different industries is the possible amount of annual earnings, this fact is of the greatest significance. In the second place, it should be remem-

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bered that the amount of weekly earnings in large part determines for the employees the desirability of employment in any particular industry, and the desirability of shorter working hours is in general regarded as secondary to the possibility for securing at least a fair amount of income each week. The longer working hours of the steel industry, therefore, while not in themselves desired by any class of workmen do influence workmen, particularly the less skilled, to enter the steel industry at the same or a slightly lower rate of hourly wages because of the larger amount of weekly earnings which the longer hours make possible.

EARNINGS.

The fact of greatest general significance developed in the study of earnings for particular occupations is the wide variation which exists between the various districts of the country as regards the wages paid unskilled laborers, and the further fact that for the more highly skilled employees wages are nearly standardized throughout the country. For example, it will be shown in the tables which follow that while the rate of wages for unskilled laborers in the Southern district is very much lower than in any other part of the country, the plants in that district find it necessary to pay as high (or higher) wages for the more highly skilled men in the mechanical trades, such as boiler makers, electricians, machinists, and millwrights, as the same class of employees receive in any other part of the country. On the other hand, while the wages of unskilled laborers are somewhat higher in the Eastern district than in the Southern district, the highly skilled workmen in the Eastern district receive much lower wages than the same class of labor can be hired for in any other part of the country. It is unnecessary at this point to enter fully into a discussion of this question, as it is covered in great detail in the discussion of the separate occupations.

Before entering into a discussion of the separate occupations, however, it is necessary to present, chiefly for purposes of reference, the data for the various occupations in each of the districts and throughout the country as a whole.

The table which follows shows for each of the principal occupations the number and per cent of employees earning each classified amount per hour:

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NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY OCCUPATIONS.

NUMBER.

Occupations.	Normal number of employees.	Employees earning each classified amount per hour.											
		Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Blacksmiths	1,287	.....	4	4	22	17	183	453	577	26	1	.....	.....
Blacksmiths' helpers	1,662	17	47	224	326	524	497	27	.....	.....	.....	.....	.....
Boiler makers	786	.....	2	.....	3	.....	107	233	434	7	.....	.....	.....
Boiler makers' helpers	995	1	10	16	269	405	274	16	4	.....	.....	.....	.....
Brakemen, conductors, and switchmen	1,831	8	49	154	356	364	422	333	143	2	.....	.....	.....
Bricklayers	1,450	.....	.....	36	5	3	48	86	364	593	215	89	11
Bricklayers' helpers	1,288	6	124	182	693	201	61	16	4	1	.....	.....	.....
Carpenters	1,960	.....	8	18	22	37	428	1,070	365	9	3	.....	.....
Electricians	1,008	.....	.....	1	9	52	351	474	119	2	.....	.....	.....
Engineers, yard locomotive	1,359	.....	5	8	57	90	498	468	233	.....	.....	.....	.....
Firemen, stationary	2,829	57	74	438	1,090	758	394	18	.....	.....	.....	.....	.....
Gasmen	1,970	.....	9	312	728	458	416	38	9	.....	.....	.....	.....
Laborers	19,848	105	2,575	4,692	11,954	236	267	18	1	.....	.....	.....	.....
Machinists	5,405	.....	1	10	15	30	734	1,657	2,811	135	12	.....	.....
Machinists' helpers	2,459	26	98	258	765	594	622	95	1	.....	.....	.....	.....
Millwrights	1,066	.....	.....	.....	4	29	297	473	253	9	1	.....	.....
Millwrights' helpers	845	.....	7	13	239	256	314	14	2	.....	.....	.....	.....
Oilers and wipers	1,992	22	55	131	975	568	220	20	1	.....	.....	.....	.....
Pipe fitters	1,034	.....	3	1	16	29	266	491	223	5	.....	.....	.....
Riggers	1,887	.....	.....	415	110	332	777	227	25	1	.....	.....	.....
Roll turners	715	.....	.....	.....	9	.....	37	81	490	65	21	6	6
All other occupations	27,567	947	1,108	2,648	7,988	4,857	5,889	2,638	1,313	135	33	5	6
Total	81,243	1,189	4,179	9,561	25,655	9,840	13,102	8,946	7,372	990	286	100	23

PER CENT.

Blacksmiths	1,287	.....	0.31	0.31	1.71	1.32	14.22	35.20	44.83	2.02	0.08	.....	.....
Blacksmiths' helpers	1,662	1.02	2.83	13.48	19.61	31.53	29.90	1.62	.....	.....	.....	.....	.....
Boiler makers	786	.....	.25	.....	.38	.....	13.61	29.64	55.22	.89	.....	.....	.....
Boiler makers' helpers	995	.10	1.01	1.61	27.04	40.70	27.54	1.61	.40	.....	.....	.....	.....
Brakemen, conductors, and switchmen	1,831	.44	2.68	8.41	19.44	19.88	23.05	18.19	7.81	.11	.....	.....	.....
Bricklayers	1,450	.....	.....	2.48	.21	.34	3.31	5.93	25.10	40.90	14.83	6.14	0.76
Bricklayers' helpers	1,288	.47	9.63	14.13	53.80	15.61	4.74	1.24	.31	.08	.....	.....	.....
Carpenters	1,960	.....	.41	.92	1.12	1.89	21.84	54.59	18.62	.46	.15	.....	.....
Electricians	1,008	.....	.....	.10	.89	5.16	34.82	47.02	11.81	.20	.....	.....	.....
Engineers, yard locomotive	1,359	.....	.37	.59	4.19	6.62	36.64	34.44	17.14	.....	.....	.....	.....
Firemen, stationary	2,829	2.01	2.62	15.48	38.53	26.79	13.93	.64	.....	.....	.....	.....	.....
Gasmen	1,970	.....	.46	15.84	36.95	23.25	21.12	1.93	.46	.....	.....	.....	.....
Laborers	19,848	.53	12.97	23.64	60.23	1.19	1.35	.09	.01	.....	.....	.....	.....
Machinists	5,405	.....	.02	.19	.28	.56	13.58	30.66	52.01	2.50	.22	.....	.....
Machinists' helpers	2,459	1.06	3.99	10.49	31.11	24.16	25.29	3.86	.04	.....	.....	.....	.....
Millwrights	1,066	.....	.....	.....	.38	2.72	27.86	44.37	23.73	.84	.09	.....	.....
Millwrights' helpers	845	.....	.83	1.54	28.28	30.30	37.16	1.66	.24	.....	.....	.....	.....
Oilers and wipers	1,992	1.10	2.76	6.58	48.95	28.51	11.04	1.00	.05	.....	.....	.....	.....
Pipe fitters	1,034	.....	.29	.10	1.51	2.80	25.73	47.49	21.57	.48	.....	.....	.....
Riggers	1,887	.....	.....	21.99	5.83	17.59	41.18	12.03	1.32	.05	.....	.....	.....
Roll turners	715	.....	.....	.....	1.26	.....	5.17	11.33	68.53	9.09	2.94	.84	.84
All other occupations	27,567	3.44	4.02	9.61	28.98	17.62	21.36	9.57	4.76	.49	.12	.02	.02
Total	81,243	1.46	5.14	11.77	31.58	12.11	16.13	11.01	9.07	1.22	.35	.12	.03

It will be seen in the above table that in practically all the higher paid occupations there are a few employees at very low rates. This is due in large part to the lack of clear classification in the various plants between the skilled occupations and the helpers. In many cases such a division between the skilled occupations and the helpers is extremely difficult and can be made only arbitrarily. Such an arbitrary division, of course, can not be made unless all the facts in the case are known, and the amount of time involved in clearing up

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the situation for these few employees would have been so great as to be absolutely prohibitive. Furthermore, in many cases it was found that relatively unskilled men were performing the work done in other plants by men of great skill, this being made possible by extreme specialization of work and by elaborate supervision. In any case the number of employees in the skilled occupations paid the unusually low rates is so small as to be ignored. It should be understood, however, that the facts shown in the above table are as they were reported to the Bureau, except that wherever data were readily obtainable the greatest care was taken to make the classification as accurate as possible.

It will be noted that in this table, as well as in the tables which follow, the number of employees included in "All other occupations" is very large, although it should be said that these occupations possess no particular interest. Moreover, the detailed data for all the occupations included under this title are shown for each separate plant in Table III of Volume II of this report, and for each department by districts in Table IV of the same volume.

The table which follows shows for each district the number of employees in each occupation earning each classified amount per hour:

NUMBER OF EMPLOYEES IN EACH OCCUPATION EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS.

NEW ENGLAND DISTRICT.

Occupations.	Normal number of employees.	Number of employees earning each classified amount per hour.											
		Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Blacksmiths	47	.....	.....	.....	.....	.....	7	23	17	.....	.....	.....	.....
Blacksmiths' helpers	56	.....	.....	1	24	26	5	.....	.....	.....	.....	.....	.....
Boiler makers	2	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	.....
Boiler makers' helpers	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brakemen, conductors, and switchmen	25	.....	.....	2	5	16	2	.....	.....	.....	.....	.....	.....
Bricklayers	39	.....	.....	.....	.....	.....	.....	8	16	5	6	4	.....
Bricklayers' helpers	50	.....	.....	17	17	.....	16	.....	.....	.....	.....	.....	.....
Carpenters	62	.....	.....	.....	.....	.....	24	30	7	1	.....	.....	.....
Electricians	38	.....	.....	.....	.....	.....	14	19	5	.....	.....	.....	.....
Engineers, yard locomotive	27	.....	.....	.....	.....	2	23	1	1	.....	.....	.....	.....
Firemen, stationary	80	.....	.....	10	6	20	38	6	.....	.....	.....	.....	.....
Gasmen	43	.....	.....	3	10	7	14	7	2	.....	.....	.....	.....
Laborers	341	.....	.....	183	142	16	.....	.....	.....	.....	.....	.....	.....
Machinists	172	.....	.....	.....	.....	.....	29	118	23	.....	2	.....	.....
Machinists' helpers	39	.....	.....	4	14	10	11	.....	.....	.....	.....	.....	.....
Millwrights	10	.....	.....	.....	.....	.....	2	5	2	.....	1	.....	.....
Millwrights' helpers	4	.....	.....	.....	1	2	1	.....	.....	.....	.....	.....	.....
Oilers and wipers	25	.....	.....	8	9	3	3	2	.....	.....	.....	.....	.....
Pipe fitters	18	.....	.....	.....	.....	.....	2	14	2	.....	.....	.....	.....
Riggers	11	.....	.....	.....	.....	.....	10	.....	1	.....	.....	.....	.....
Roll turners	15	.....	.....	.....	1	.....	3	7	2	1	1	.....	.....
All other occupations	483	7	1	32	169	80	111	35	39	8	1	.....	.....
Total	1,587	7	1	260	398	182	316	276	117	15	11	4	.....

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NUMBER OF EMPLOYEES IN EACH OCCUPATION EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—Continued.

EASTERN DISTRICT.

Occupations.	Normal number of employees.	Number of employees earning each classified amount per hour.											
		Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Blacksmiths	209				2	12	69	92	32	2			
Blacksmiths' helpers	253		11	75	143	16	7	1					
Boiler makers	67						18	21	28				
Boiler makers' helpers	63				44	19							
Brakemen, conductors, and switchmen	285		8	62	94	12	95	9	5				
Bricklayers	267			36	5	2	31	51	84	55	2	1	
Bricklayers' helpers	258		109	115	14	14	5	1					
Carpenters	197			2	4	11	89	75	13	3			
Electricians	120			1	6	5	50	46	12				
Engineers, yard locomotive	183			3	21	39	62	58					
Firemen, stationary	433	5	27	164	144	34	56	3					
Gasmen	525			217	115	97	80	16					
Laborers	1,874	39	639	1,053	124	16	3						
Machinists	844				6	15	212	406	203		2		
Machinists' helpers	395	8	34	120	147	60	18	7	1				
Millwrights	86				3	3	33	29	18				
Millwrights' helpers	40		2	5	20	6	7						
Oilers and wipers	155	3	18	34	63	28	8	1					
Pipe fitters	142				3	5	77	51	6				
Riggers	155			13	32	15	46	42	7				
Roll turners	120				8		14	16	58	15	7		2
All other occupations	3,585	185	234	919	936	412	464	235	95	12	3		
Total	10,256	240	1,172	2,819	1,934	821	1,444	1,160	562	87	14	1	2

PITTSBURGH DISTRICT.

Blacksmiths	609				12	3	65	212	305	12			
Blacksmiths' helpers	769	12	8	114	74	285	268	8					
Boiler makers	373						58	106	209				
Boiler makers' helpers	390		1		12	272	94	7	4				
Brakemen, conductors, and switchmen	1,089	4		81	171	220	205	291	116	1			
Bricklayers	531					1	8	15	88	351	49	19	
Bricklayers' helpers	606		3	27	458	83	21	13	1				
Carpenters	764			1	2	18	135	427	179	2			
Electricians	413				2	26	173	180	30	2			
Engineers, yard locomotive	741				18	45	207	272	199				
Firemen, stationary	1,205		1	74	446	539	143	2					
Gasmen	692		1		201	284	188	14	4				
Laborers	10,326	14	1,175	1,831	6,976	121	199	9	1				
Machinists	2,358		1			11	330	518	1,398	92	8		
Machinists' helpers	675	5	10	84	184	240	138	14					
Millwrights	703				1	17	231	292	156	6			
Millwrights' helpers	593		5	5	149	168	256	8	2				
Oilers and wipers	938	2	10	27	421	344	128	6					
Pipe fitters	500				2	17	134	236	108	3			
Riggers	993			401	41	193	224	122	11	1			
Roll turners	361						13	31	266	38	7	2	4
All other occupations	14,421	406	438	1,039	4,415	2,973	3,102	1,283	672	78	6	3	6
Total	40,050	443	1,653	3,684	13,585	5,860	6,320	4,066	3,749	586	70	24	10

GREAT LAKES AND MIDDLE WEST DISTRICT.

Blacksmiths	347				1	1	33	113	188	10	1		
Blacksmiths' helpers	471	1	9	10	50	167	217	17					
Boiler makers	300		2		3		29	100	163	3			
Boiler makers' helpers	459		1	11	178	87	173	9					
Brakemen, conductors, and switchmen	325			2	63	88	116	33	22	1			
Bricklayers	489						9	12	170	170	66	51	11
Bricklayers' helpers	315			23	164	104	19	1	3	1			
Carpenters	707					1	85	457	162	1	1		
Electricians	404				1	17	109	205	72				
Engineers, yard locomotive	300						146	122	32				
Firemen, stationary	891	2		91	482	158	154	4					
Gasmen	588			2	390	70	123		3				

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NUMBER OF EMPLOYEES IN EACH OCCUPATION EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—Concluded.

GREAT LAKES AND MIDDLE WEST DISTRICT—Concluded.

Occupations.	Normal number of employees.	Number of employees earning each classified amount per hour.											
		Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Laborers	5,666	1	17	913	4,627	82	26						
Machinists	1,717			1		2	135	541	997	41			
Machinists' helpers	1,152	8	6	19	353	263	431	72					
Millwrights	234					8	25	143	57	1			
Millwrights' helpers	159				42	80	31	6					
Oilers and wipers	768		2	17	467	192	79	10	1				
Pipe fitters	325				10	4	45	165	99	2			
Riggers	658			1	37	106	451	57	6				
Roll turners	196						7	27	148	6	4	4	
All other occupations	7,581	161	79	395	2,328	1,281	1,946	955	376	35	23	2	
Total	24,052	173	116	1,485	9,186	2,711	4,399	3,049	2,499	271	95	57	11

SOUTHERN DISTRICT.

Blacksmiths	74		4	4	7	1	9	13	35	1			
Blacksmiths' helpers	112	4	19	24	35	30							
Boiler makers	44						1	5	34	4			
Boiler makers' helpers	83	1	8	5	35	27	7						
Brakemen, conductors, and switchmen	107	4	41	7	23	28	4						
Bricklayers	122								5	12	92	13	
Bricklayers' helpers	58	6	12		40								
Carpenters	229		8	15	16	7	95	81	3	2	2		
Electricians	33					4	5	24					
Engineers, yard locomotive	108		5	5	18	4	60	15	1				
Firemen, stationary	217	50	46	99	12	7	3						
Gasmen	122		8	90	22		1	1					
Laborers	1,593	51	744	712	85	1							
Machinists	311			9	9	2	28	73	188	2			
Machinists' helpers	196	4	48	30	67	21	24	2					
Millwrights	32					1	6	4	20	1			
Millwrights' helpers	49			3	27		19						
Oilers and wipers	105	17	25	45	15	1	2						
Pipe fitters	48		3	1	1	3	8	25	7				
Riggers	70					18	46	6					
Roll turners	22								16	5	1		
All other occupations	1,463	188	266	263	140	111	256	115	123	1			
Total	5,198	325	1,237	1,312	552	266	574	364	432	28	95	13	

PACIFIC COAST DISTRICT.

Blacksmiths	1									1			
Blacksmiths' helpers	1							1					
Boiler makers													
Boiler makers' helpers													
Brakemen, conductors, and switchmen													
Bricklayers	2								1			1	
Bricklayers' helpers	1							1					
Carpenters	1								1				
Electricians													
Engineers, yard locomotive													
Firemen, stationary	3							3					
Gasmen													
Laborers	48						39	9					
Machinists	3							1	2				
Machinists' helpers	2	1		1									
Millwrights	1									1			
Millwrights' helpers													
Oilers and wipers	1							1					
Pipe fitters	1								1				
Riggers													
Roll turners	1										1		
All other occupations	34						10	15	8	1			
Total	100	1		1			49	31	13	3	1	1	

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BLACKSMITHS.

Data relative to the earnings and hours of labor were reported for 1,287 blacksmiths. The earnings for 80.03 per cent of the blacksmiths were 25 and less than 40 cents per hour. Only 2.10 per cent of the blacksmiths earned as much as 40 cents per hour while 17.87 per cent earned less than 25 cents per hour. There was a considerable difference between the earnings of blacksmiths in the different districts, as will be seen from the following table.

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—BLACKSMITHS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.					
		Under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 cents and over.
New England	47	.....	.....	7	23	17	.....
Eastern	209	2	12	69	92	32	2
Pittsburgh	609	12	3	65	212	305	12
Great Lakes and Middle West	347	1	1	33	113	188	11
Southern	74	15	1	9	13	35	1
Pacific Coast	1	.....	.....	.....	.....	.....	1
Total	1,287	30	17	183	453	577	27

PER CENT.

New England	47	.....	.....	14.89	48.94	36.17	.....
Eastern	209	0.96	5.74	33.01	44.02	15.31	0.96
Pittsburgh	609	1.97	.49	10.67	34.81	50.08	1.97
Great Lakes and Middle West	347	.29	.29	9.51	32.56	54.18	3.17
Southern	74	20.27	1.35	12.16	17.57	47.30	1.35
Pacific Coast	1	.....	.....	.....	.....	.....	(1)
Total	1,287	2.33	1.32	14.22	35.20	44.83	2.10

[1] Not given on account of the small number involved.

The general level of earnings of blacksmiths was very nearly the same in the Pittsburgh and the Great Lakes and Middle West districts, there being a slight difference in favor of the Great Lakes and Middle West district. In both of these districts approximately 85 per cent of the employees earned 25 and less than 40 cents per hour, and 50.08 per cent in the Pittsburgh district and 54.18 per cent in the Great Lakes and Middle West district earned 30 and under 40 cents per hour. The earnings in the Eastern district were decidedly lower than in either of the other principal districts, approximately 77 per cent of the employees in that district earning 20 and under 30 cents per hour. In the Southern district a rather unusual situation is presented, although the number is so small as to make the proportion somewhat uncertain. It is true, however, as indicated by the figures above, that the blacksmiths' work in the southern steel plants is being done by two different classes of workmen. The class earning the lower

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rates, under 18 cents per hour, of whom there were approximately 20 per cent of the total number, are largely Negroes, who can be employed at this rate of wages, but who are able to perform only the coarser and less difficult work. For the higher grade of work it is necessary to employ highly skilled white blacksmiths, and for this class of workmen, it will be noted, the steel plants in the Southern district pay very nearly the same rate of wages as the plants in the Pittsburgh and the Great Lakes and Middle West districts, and decidedly higher wages than are generally paid in the Eastern district. This comparison of the earnings in the different districts, however, is more easily made from the summary in the form of cumulative percentages which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—BLACKSMITHS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—				
		Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.
New England	47	.....	.....	14.89	63.83	100.00
Eastern	209	0.96	6.70	39.71	83.73	99.04
Pittsburgh	609	1.97	2.46	13.14	47.95	98.03
Great Lakes and Middle West	347	.29	.58	10.09	42.65	96.83
Southern	74	20.27	21.62	33.78	51.35	98.65
Pacific Coast	1	.....	.....	.....	.....	(1)
Total	1,287	2.33	3.65	17.87	53.07	97.90

[1] Not given on account of small number involved.

BLACKSMITHS' HELPERS.

Data relative to the earnings and hours of labor were reported for 1,662 blacksmiths' helpers in the various districts. Approximately 61 per cent of the employees in this occupation earned 18 and less than 25 cents per hour, there being only 1.62 per cent who earned as much as 25 cents per hour, while 36.94 per cent earned less than 18 cents per hour. A small number of the blacksmiths' helpers in each of the four principal districts earned less than 14 cents per hour. There was considerable variation among the different districts as regards the relative earnings per hour of this class of employees. The general level of earnings was decidedly higher in the Great Lakes and Middle West district than in any one of the other principal districts. In that district 85.14 per cent of all employees earned 18 cents or more per hour while in the Pittsburgh district only 72.95 per cent of the employees earned as much as 18 cents per hour. The earnings in both the Eastern and Southern districts were decidedly lower than in either of the other principal districts.

The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

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NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—BLACKSMITHS' HELPERS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.					
		Under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 cents and over.
New England	56	.....	1	24	26	5	.....
Eastern	253	11	75	143	16	7	1
Pittsburgh	769	20	114	74	285	268	8
Great Lakes and Middle West	471	10	10	50	167	217	17
Southern	112	23	24	35	30	.....	.....
Pacific Coast	1	.....	.....	.....	.....	.....	1
Total	1,662	64	224	326	524	497	27

PER CENT.

New England	56	.....	1.79	42.86	46.43	8.93	.....
Eastern	253	4.35	29.64	56.52	6.32	2.77	0.40
Pittsburgh	769	2.60	14.82	9.62	37.06	34.85	1.04
Great Lakes and Middle West	471	2.12	2.12	10.62	35.46	46.07	3.61
Southern	112	20.54	21.43	31.25	26.79	.....	.....
Pacific Coast	1	.....	.....	.....	.....	.....	[1]
Total	1,662	3.85	13.48	19.61	31.53	29.90	1.62

[1] Not given on account of the small number involved.

A comparison of the relative earnings in the different districts can, however, be more easily made from the summary in the form of cumulative percentages which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—BLACKSMITHS' HELPERS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—				
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.
New England	56	.....	1.79	44.64	91.07	100.00
Eastern	253	4.35	33.99	90.51	96.84	99.60
Pittsburgh	769	2.60	17.43	27.05	64.11	98.96
Great Lakes and Middle West	471	2.12	4.25	14.86	50.32	96.39
Southern	112	20.54	41.96	73.21	100.00	100.00
Pacific Coast	1	.....	.....	.....	.....	[1]
Total	1,662	3.85	17.33	36.94	68.47	98.38

[1] Not given on account of small number involved.

BOILER MAKERS.

Data relative to the earnings and hours of labor were reported for 786 boiler makers, the larger part of whom, 55.22 per cent, earned 30 and less than 40 cents per hour. Less than 1 per cent, however, earned as much as 40 cents and 43.89 per cent earned less than 30 cents per hour. The number of employees in this occupation is too small to admit of a close comparison of the relative earnings in the different districts except for the Pittsburgh and the Great Lakes and

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Middle West districts, in which districts the general level of earnings for this class of employees was very nearly the same. While the numbers reported in the other two principal districts are too small to admit of a close comparison, there is sufficient to indicate that the steel plants in the Southern district are paying higher wages than either of the other districts in order to secure boiler makers, while in the Eastern district this class of employees can be hired for very much lower rates than anywhere else in the country.

The following table shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—BOILER MAKERS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.					
		Under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 cents and over.
New England	2	.....	.....	1	1	.....	.....
Eastern	67	.....	.....	18	21	28	.....
Pittsburgh	373	.....	.....	58	106	209	.....
Great Lakes and Middle West	300	5	.....	29	100	163	3
Southern	44	.....	.....	1	5	34	4
Total	786	5	.....	107	233	434	7

PER CENT.

New England	2	.....	.....	50.00	50.00	.....	.....
Eastern	67	.....	.....	26.87	31.34	41.79	.....
Pittsburgh	373	.....	.....	15.55	28.42	56.03	.....
Great Lakes and Middle West	300	1.67	.....	9.67	33.33	54.33	1.00
Southern	44	.....	.....	2.27	11.36	77.27	9.09
Total	786	.64	.....	13.61	29.64	55.22	.89

A comparison between the different districts is more clearly shown, however, in the summary in the form of cumulative percentages which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—BOILER MAKERS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—				
		Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.
New England	2	.....	.....	50.00	100.00	100.00
Eastern	67	.....	.....	26.87	58.21	100.00
Pittsburgh	373	.....	.....	15.55	43.97	100.00
Great Lakes and Middle West	300	1.67	1.67	11.33	44.67	99.00
Southern	44	.....	.....	2.27	13.64	90.91
Total	786	.64	.64	14.25	43.89	99.11

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BOILER MAKERS' HELPERS.

Data relative to the earnings and hours of labor were reported for 995 employees classed as boiler makers' helpers. The larger part of these employees are riveters, although a number of lower grade occupations, which are sometimes specialized, are also included. Practically all of the boiler makers' helpers earned 16 and less than 25 cents per hour, there being only 2.01 per cent who earned as much as 25 cents per hour and only 2.71 per cent who earned less than 16 cents per hour. The general level of earnings for this class of employees was lower in the Southern district than in either of the other districts, although the Eastern district shows a somewhat larger proportion earning under 18 cents per hour. The relation between the different districts as regards hourly earnings is shown by the following table. This table shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—BOILER MAKERS' HELPERS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.					
		Under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 cents and over.
Eastern	63	.....	.....	44	19	.....	.....
Pittsburgh	390	1	.....	12	272	94	11
Great Lakes and Middle West	459	1	11	178	87	175	9
Southern	83	9	5	35	27	7	.....
Total	995	11	16	269	405	274	20

PER CENT.

Eastern	63	.....	.....	69.84	30.16	.....	.....
Pittsburgh	390	0.26	.....	3.08	69.74	24.10	2.82
Great Lakes and Middle West	459	.22	2.40	38.78	18.95	37.69	1.96
Southern	83	10.84	6.02	42.17	32.53	8.43	.....
Total	995	1.11	1.61	27.04	40.70	27.54	2.01

A comparison of the earnings in the different districts can more readily be made from the summary in the form of cumulative percentages which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—BOILER MAKERS' HELPERS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—				
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.
Eastern	63	.....	.....	69.84	100.00	100.00
Pittsburgh	390	0.26	0.26	3.33	73.08	97.18
Great Lakes and Middle West	459	.22	2.61	41.39	60.35	98.04
Southern	83	10.84	16.87	59.04	91.57	100.00
Total	995	1.11	2.71	29.75	70.45	97.99

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BRAKEMEN, CONDUCTORS, AND SWITCHMEN.

Data relative to the earnings and hours of labor were reported for 1,831 employees classed as brakemen, conductors, and switchmen. These employees all work in connection with the yard-transportation system and while different names are frequently given the employees in these occupations the general character of the work is very much the same for all three. The term "conductors," it should be particularly noted, does not imply any considerable degree of skill or knowledge, as these men are little more than switchmen and have no authority over the general movement of the various yard locomotives and trains. The wide variations in earnings for these employees arise from two factors; first, the specific duties of the individual employed, and second, whether he is employed in connection with the standard-gauge transportation equipment or only in connection with the narrow-gauge (dinkey) locomotive. Practically all of these employees, however, earned less than 30 cents per hour, there being only 7.92 per cent who earned as much as 30 cents per hour. The earnings for this general class of employees were decidedly lower in the Southern district than in any of the other districts, and they were decidedly higher in the Pittsburgh district than in the Great Lakes and Middle West district or in any of the other districts:

The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—BRAKEMEN, CONDUCTORS, AND SWITCHMEN.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.					
		Under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 cents and over.
New England	25	2	5	16	2	.....	.....
Eastern	285	70	94	12	95	9	5
Pittsburgh	1,089	85	171	220	285	221	117
Great Lakes and Middle West	325	2	63	88	116	33	23
Southern	107	52	23	28	4	.....	.....
Total	1,831	211	356	364	422	333	145

PER CENT.

New England	25	8.00	20.00	64.00	8.00	.....	.....
Eastern	285	24.56	32.98	4.21	33.33	3.16	1.75
Pittsburgh	1,089	7.81	15.70	20.20	18.82	26.72	10.74
Great Lakes and Middle West	325	.62	19.38	27.08	35.69	10.15	7.08
Southern	107	48.60	21.50	26.17	3.74	.....	.....
Total	1,831	11.52	19.44	19.88	23.05	18.19	7.92

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A comparison of the earnings in the various districts can be more easily made from the summary in the form of cumulative percentages which follows. This table shows clearly the wide variation between the earnings in the different districts.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—BRAKEMEN, CONDUCTORS, AND SWITCHMEN.

Districts.	Normal number of employees.	Per cent of employees earning per hour—				
		Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.
New England	25	8.00	28.00	92.00	100.00	100.00
Eastern	285	24.56	57.54	61.75	95.09	98.25
Pittsburgh	1,089	7.81	23.51	43.71	62.53	80.26
Great Lakes and Middle West	325	.62	20.00	47.08	82.77	92.92
Southern	107	48.60	70.09	96.26	100.00	100.00
Total	1,831	11.52	30.97	50.85	73.89	92.08

BRICKLAYERS.

Data relative to the earnings and hours of labor were reported for 1,450 bricklayers. In considering the earnings of these bricklayers it should be understood that very nearly constant employment throughout the year is afforded these workmen in the steel industry, whereas, in the ordinary building trades the work is very largely seasonal, and the total number of days worked per year is far short of the number in an industry such as this. The larger number of the bricklayers employed in the steel industry earned 30 and less than 50 cents per hour, there being 66 per cent whose earnings fell within these limits. There were, however, 12.28 per cent who earned under 30 cents per hour, and only 6.90 per cent who earned as much as 60 cents per hour. The earnings of bricklayers were decidedly lower in the Eastern district than in any one of the other principal districts. In that district which, it will be recalled, includes New Jersey and the eastern part of Pennsylvania 78.28 per cent of the employees earned less than 40 cents per hour. In the Pittsburgh district, on the other hand, 78.91 per cent of the bricklayers received 40 cents or more per hour, while in the Southern district 95.90 per cent earned 40 cents or more per hour.

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The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—BRICKLAYERS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.					
		Under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 and under 60 cents.	60 cents and over.
New England	39	.....	8	16	5	6	4
Eastern	267	74	51	84	55	2	1
Pittsburgh	531	9	15	88	351	49	19
Great Lakes and Middle West	489	9	12	170	170	66	62
Southern	122	.....	.....	5	12	92	13
Pacific Coast	2	.....	.....	1	.....	.....	1
Total	1,450	92	86	364	593	215	100

PER CENT.

New England	39	.....	20.51	41.03	12.82	15.38	10.26
Eastern	267	27.72	19.10	31.46	20.60	.75	.37
Pittsburgh	531	1.69	2.82	16.57	66.10	9.23	3.58
Great Lakes and Middle West	489	1.84	2.45	34.76	34.76	13.50	12.68
Southern	122	.....	.....	4.10	9.84	75.41	10.66
Pacific Coast	2	.....	.....	(1)	.....	.....	(1)
Total	1,450	6.34	5.93	25.10	40.90	14.83	6.90

[1] Not given on account of the small number involved.

A comparison of the earnings in the various districts can be made somewhat more easily from the summary in the form of cumulative percentages which follows.

The most striking fact to be noted in the consideration of this table is the relatively high wages which bricklayers in the Southern district receive. In that district 86.07 per cent of all bricklayers received 50 cents or more per hour.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—BRICKLAYERS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—				
		Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.	Under 60 cents.
New England	39	.....	20.51	61.54	74.36	89.74
Eastern	267	27.72	46.82	78.28	98.88	99.63
Pittsburgh	531	1.69	4.52	21.09	87.19	96.42
Great Lakes and Middle West	489	1.84	4.29	39.06	73.82	87.32
Southern	122	.....	.....	4.10	13.98	89.34
Pacific Coast	2	.....	.....	(1)	(1)	(1)
Total	1,450	6.34	12.28	37.38	78.28	93.10

[1] Not given on account of the small number involved.

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BRICKLAYERS' HELPERS.

Data relative to the earnings and hours of labor were reported for 1,288 employees classed as bricklayers' helpers. These helpers were, for the most part, the hod carriers and various other semi-skilled or unskilled workmen whose duties involved a large amount of very hard manual labor. Approximately 70 per cent of the bricklayers' helpers earned 16 and less than 20 cents per hour. The general level of earnings for the bricklayers' helpers was highest in the Great Lakes and Middle West district. In only three of the districts, as will be seen from the table which follows, is the number of employees large enough to permit of any comparison of earnings.

This table shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—BRICKLAYERS' HELPERS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.					
		Under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 cents and over.
New England	50	.....	17	17	.....	16	.....
Eastern	258	109	115	14	14	5	1
Pittsburgh	606	3	27	458	83	21	14
Great Lakes and Middle West	315	.....	23	164	104	19	5
Southern	58	18	.....	40	.....	.....	.....
Pacific Coast	1	.....	.....	.....	.....	.....	1
Total	1,288	130	182	693	201	61	21

PER CENT.

New England	50	.....	34.00	34.00	.....	32.00	.....
Eastern	258	42.25	44.57	5.43	5.43	1.94	0.39
Pittsburgh	606	.50	4.46	75.58	13.70	3.47	2.31
Great Lakes and Middle West	315	.....	7.30	52.06	33.02	6.03	1.59
Southern	58	31.03	.....	68.97	.....	.....	.....
Pacific Coast	1	.....	.....	.....	.....	.....	(1)
Total	1,288	10.09	14.13	53.80	15.61	4.74	1.63

[1] Not given on account of the small number involved.

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A comparison of the earnings in the various districts may, however, be more easily made from the summary in the form of cumulative percentages which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—BRICKLAYERS' HELPERS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—				
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.
New England	50	.....	34.00	68.00	68.00	100.00
Eastern	258	42.25	86.82	92.25	97.67	99.61
Pittsburgh	606	.50	4.95	80.52	94.22	97.69
Great Lakes and Middle West	315	.....	7.30	59.37	92.38	98.41
Southern	58	31.03	31.03	100.00	100.00	100.00
Pacific Coast	1	.....	.....	.....	.....	[1]
Total	1,288	10.09	24.22	78.03	93.63	98.37

[1] Not given on account of the small number involved.

CARPENTERS.

Data relative to the earnings and hours of labor were reported for 1,960 carpenters. Generally speaking, the class of carpentering work done in steel works is not of the highest grade, and in a very large number of cases the employees classified under this general heading of carpenters are what are generally known in the trade as "hatchet and saw men." Slightly more than three-fourths of the carpenters (76.43 per cent) earned 20 and less than 30 cents per hour, there being 19.23 per cent who earned 30 cents per hour or more and only 4.34 per cent who earned less than 20 cents per hour. The general level of earnings for this class of employees was highest in the Great Lakes and Middle West district. It will be remembered that for the most of the other skilled occupations the wages in the Southern district have on the whole been decidedly better than in the eastern district and very much the same as in the Pittsburgh and the Great Lakes and Middle West districts. For the carpenters, however, the situation in the Southern district is entirely opposite, the wages in that district being decidedly lower than in any of the other districts. This is explained largely by the fact that for a number of generations in the South the Negro has been trained to do carpenter work. This fact has greatly increased the supply of carpenters in the South and, consequently, has depressed their earnings as compared with the other highly skilled occupations.

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The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—CARPENTERS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.					
		Under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 cents and over.
New England	62	.....	.....	.....	24	30	8
Eastern	197	2	4	11	89	75	16
Pittsburgh	764	1	2	18	135	427	181
Great Lakes and Middle West	707	.....	.....	1	85	457	164
Southern	229	23	16	7	96	81	7
Pacific Coast	1	.....	.....	.....	.....	.....	1
Total	1,960	26	22	37	428	1,070	377

PER CENT.

New England	62	.....	.....	.....	38.71	48.39	12.90
Eastern	197	1.02	2.03	5.58	45.18	38.07	8.12
Pittsburgh	764	.13	.26	2.36	17.67	55.89	23.69
Great Lakes and Middle West	707	.....	.....	.14	12.02	64.64	23.20
Southern	229	10.04	6.99	3.06	41.48	35.37	3.06
Pacific Coast	1	.....	.....	.....	.....	.....	(1)
Total	1,960	1.33	1.12	1.89	21.84	54.59	19.23

[1] Not given on account of the small number involved.

A comparison of the earnings in the various districts may, however, be more easily made from the summary in the form of cumulative percentages which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—CARPENTERS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—				
		Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.
New England	62	.....	.....	.....	38.71	87.10
Eastern	197	1.02	3.05	8.63	53.81	91.88
Pittsburgh	764	.13	.39	2.75	20.42	76.31
Great Lakes and Middle West	707	.....	.....	.14	12.16	76.80
Southern	229	10.04	17.03	20.09	61.57	96.94
Pacific Coast	1	.....	.....	.....	.....	(1)
Total	1,960	1.33	2.45	4.34	26.17	80.77

[1] Not given on account of the small number involved.

ELECTRICIANS.

Data relative to the earnings and hours of labor were reported for 1,008 electricians. This group includes both the electricians engaged in repair work and the motor inspectors and various other employees whose duty is to inspect electrical machinery. In many cases, of

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course, these employees also make repairs. The earnings of 81.85 per cent of the electricians in all districts were 20 and less than 30 cents per hour. There were, however, 12 per cent who earned 30 cents or more per hour and only 6.15 per cent who received less than 20 cents per hour. The general level of earnings for electricians was highest in the Great Lakes and Middle West district, although considering only the three principal districts it will be seen that the variation between the different districts was not large.

The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—ELECTRICIANS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.					
		Under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 cents and over.
New England	38	.....	.....	14	19	5	.....
Eastern	120	7	5	50	46	12	.....
Pittsburgh	413	2	26	173	180	30	2
Great Lakes and Middle West	404	1	17	109	205	72	.....
Southern	33	.....	4	5	24	.....	.....
Total	1,008	10	52	351	474	119	2

PER CENT.

New England	38	.....	.....	36.84	50.00	13.16	.....
Eastern	120	5.83	4.17	41.67	38.33	10.00	.....
Pittsburgh	413	.48	6.30	41.89	43.58	7.26	0.48
Great Lakes and Middle West	404	.25	4.21	26.98	50.74	17.82	.....
Southern	33	.....	12.12	15.15	72.73	.....	.....
Total	1,008	.99	5.16	34.82	47.02	11.81	.20

The slight variation which exists between the different districts as regards earnings is more clearly shown in the table which follows, which shows for each of the separate districts the number and per cent of employees earning less than each specified amount per hour:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—ELECTRICIANS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—				
		Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.
New England	38	.....	.....	36.84	86.84	100.00
Eastern	120	5.83	10.00	51.67	90.00	100.00
Pittsburgh	413	.48	6.78	48.67	92.25	99.52
Great Lakes and Middle West	404	.25	4.46	31.44	82.18	100.00
Southern	33	.....	12.12	27.27	100.00	100.00
Total	1,008	.99	6.15	40.97	88.00	99.80

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ENGINEERS, YARD LOCOMOTIVE.

Data relative to the earnings and hours of labor were reported for 1,359 engineers employed on the yard locomotives. A number of these engineers were driving standard-gauge locomotives of large size but a very large proportion were employed on the small, narrow-gauge locomotives (dinkey engines) which require much less skill to operate. The difference in skill is, however, somewhat compensated by the fact that on the small engine the engineer has to do his own firing and, consequently, is kept busy a much larger proportion of the time than on the large engine. It should be noted, however, that the earnings of these engineers should not be placed in comparison with the locomotive engineers on steam railroads. The earnings of 71.08 per cent of these engineers were 20 and less than 30 cents per hour. There were, however, 17.15 per cent who earned 30 cents or more per hour and 11.77 per cent who earned less than 20 cents per hour. The general level of earnings for this class of employees was highest in the Pittsburgh district and lowest in the Southern district.

The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—ENGINEERS, YARD LOCOMOTIVE.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.					
		Under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 cents and over.
New England	27	.....	.....	2	23	1	1
Eastern	183	3	21	39	62	58	.....
Pittsburgh	741	.....	18	45	207	272	199
Great Lakes and Middle West	300	.....	.....	.....	146	122	32
Southern	108	10	18	4	60	15	1
Total	1,359	13	57	90	498	468	233

PER CENT.

New England	27	.....	.....	7.41	85.19	3.70	3.70
Eastern	183	1.64	11.48	21.31	33.88	31.69	.....
Pittsburgh	741	.....	2.43	6.07	27.94	36.71	26.86
Great Lakes and Middle West	300	.....	.....	.....	48.67	40.67	10.67
Southern	108	9.26	16.67	3.70	55.56	13.89	.93
Total	1,359	.96	4.19	6.62	36.64	34.44	17.15

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The summary which follows shows in a convenient form for comparison the number and per cent of employees earning less than each specified amount per hour:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—ENGINEERS, YARD LOCOMOTIVE.

Districts.	Normal number of employees.	Per cent of employees earning per hour—				
		Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.
New England	27	.....	.....	7.41	92.59	96.30
Eastern	183	1.64	13.11	34.43	68.31	100.00
Pittsburgh	741	.....	2.43	8.50	26.44	73.14
Great Lakes and Middle West	300	.....	.....	.....	43.67	89.33
Southern	108	9.26	25.93	29.63	85.19	99.08
Total	1,359	.96	5.15	11.77	43.42	82.86

FIREMEN, STATIONARY.

Data relative to the earnings and hours of labor were reported for 2,829 firemen of stationary engines. Nearly two-thirds of the firemen, 65.32 per cent, earned 16 and less than 20 cents per hour. There were, however, 14.56 per cent who earned 20 cents per hour or more, and 20.11 per cent who earned under 16 cents per hour. The earnings of this class of employees were decidedly lowest in the Southern district, as is also the case with all the other unskilled occupations. In that district 89.86 per cent of all the firemen, stationary, earned less than 16 cents per hour, while 23.04 per cent, or nearly one-fourth of the total number, earned less than 12 cents per hour. Comparing the four principal districts it is seen that the general level of earnings was highest in the Pittsburgh district, where 56.76 per cent of the firemen, stationary, were paid 18 cents per hour or more.

The table which follows shows for each district the number and per cent of employees earning each classified amount per hour.

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NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—FIREMEN STATIONARY.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.					
		Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 cents and over.
New England	80	.....	.....	10	6	20	44
Eastern	433	5	27	164	144	34	59
Pittsburgh	1,205	.....	1	74	446	539	145
Great Lakes and Middle West	891	2	.....	91	482	158	158
Southern	217	50	46	99	12	7	3
Pacific Coast	3	.....	.....	.....	.....	.....	3
Total	2,829	57	74	438	1,090	758	412

PER CENT.

New England	80	.....	.....	12.50	7.50	25.00	55.00
Eastern	433	1.15	6.24	37.88	33.26	7.85	13.63
Pittsburgh	1,205	.....	.08	6.14	37.01	44.73	12.08
Great Lakes and Middle West	891	.22	.....	10.21	54.10	17.73	17.73
Southern	217	23.04	21.20	45.62	5.53	3.23	1.38
Pacific Coast	3	.....	.....	.....	.....	.....	(1)
Total	2,829	2.01	2.62	15.48	38.53	26.79	14.56

[1] Not given on account of the small number involved.

The wide variations between the different districts as regards the wages paid firemen, stationary, are more clearly shown in the summary in the form of cumulative percentages, as follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—FIREMEN, STATIONARY.

Districts.	Normal number of employees.	Per cent of employees earning per hour—				
		Under 12 cents.	Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.
New England	80	.....	.....	12.50	20.00	45.00
Eastern	433	1.15	7.39	45.27	78.52	86.37
Pittsburgh	1,205	.....	.08	6.22	43.24	87.97
Great Lakes and Middle West	891	.22	.22	10.44	64.53	82.27
Southern	217	23.04	44.24	89.86	95.39	98.62
Pacific Coast	3	.....	.....	.....	.....	(1)
Total	2,829	2.01	4.63	20.11	58.64	85.44

[1] Not given on account of the small number involved.

GASMEN.

Data relative to the earnings and hours of labor were reported for 1,970 gasmen. These workmen are employed in connection with the gas producers which are operated in connection with the open-hearth department and the rolling mills. In considering the hourly earnings of this class of employees it should be noted that their weekly working hours are considerably longer than in most of the other occupations, so that their total weekly earnings will be

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relatively higher than their hourly earnings. Approximately 60 per cent of the gasmen earned 16 and less than 20 cents per hour. There were, however, 23.5 per cent who earned 20 cents or more per hour, while 16.29 per cent earned less than 16 cents. The general level of wages for this class of employees was decidedly lowest in the Southern district, where 98.36 per cent earned under 18 cents per hour. The earnings of the gasmen in the Pittsburgh district were slightly higher than in the Great Lakes and Middle West district, the proportion earning less than 18 cents per hour being much larger in the latter than in the former district.

The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—GASMEN.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.					
		Under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 cents and over.
New England	43	3	10	7	14	7	2
Eastern	525	217	115	97	80	16	.....
Pittsburgh	692	1	201	284	188	14	4
Great Lakes and Middle West	588	2	380	70	133	.....	3
Southern	122	98	22	.....	1	1	.....
Total	1,970	321	728	458	416	38	9

PER CENT.

New England	43	6.98	23.26	16.28	32.56	16.28	4.65
Eastern	525	41.33	21.90	18.48	15.24	3.05	.....
Pittsburgh	692	.14	29.05	41.04	27.17	2.02	.58
Great Lakes and Middle West	588	.34	64.63	11.90	22.63	.....	.51
Southern	122	80.33	18.03	.....	.82	.82	.....
Total	1,970	16.29	36.95	23.25	21.12	1.93	.46

The relative earnings in the different districts for gasmen are, however, more clearly shown in the summary in the form of cumulative percentages which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—GASMEN.

Districts.	Normal number of employees.	Per cent of employees earning per hour—				
		Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.
New England	43	6.98	30.23	46.51	79.07	95.35
Eastern	525	41.33	63.24	81.71	96.95	100.00
Pittsburgh	692	.14	29.19	70.23	97.40	99.42
Great Lakes and Middle West	588	.34	64.97	76.87	99.49	99.49
Southern	122	80.33	98.36	98.36	99.18	100.00
Total	1,970	16.29	53.25	76.50	97.61	99.54

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LABORERS.

Data relative to the earnings and hours of labor were reported for 19,848 laborers other than those employed in connection with the producing departments, the data for whom have already been shown in connection with each of the producing departments. It will be recalled that the complete data covering all the laborers in the entire industry have been considered in the introductory chapter of this volume. It seems important, however, to consider here separately those laborers who are not in any way connected with productive processes but who work in the yards and who, consequently, are not subject to the same conditions as regards day and night work which prevail in the producing departments. The earnings of 83.87 per cent of the laborers were 14 and under 18 cents per hour. There were, however, 13.50 per cent who earned less than 14 cents per hour, while only 2.63 per cent earned as much as 18 cents per hour. The earnings of the laborers were decidedly lowest in the Southern district, where 49.91 per cent of the employees earned less than 14 cents per hour. The general level of earnings was highest in the Pittsburgh district in spite of the fact that 11.51 per cent of the laborers in that district earned less than 14 cents per hour.

The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—LABORERS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.					
		Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 cents and over.
New England	341	.....	.....	183	142	16	.....
Eastern	1,874	39	639	1,053	124	16	3
Pittsburgh	10,326	14	1,175	1,831	6,976	121	209
Great Lakes and Middle West	5,666	1	17	913	4,627	82	26
Southern	1,593	51	744	712	85	1	.....
Pacific Coast	48	.....	.....	.....	.....	.....	48
Total	19,848	105	2,575	4,692	11,954	236	286

PER CENT.

New England	341	.....	.....	53.67	41.64	4.69	.....
Eastern	1,874	2.08	34.10	56.19	6.62	.85	0.16
Pittsburgh	10,326	.14	11.38	17.73	67.56	1.17	2.02
Great Lakes and Middle West	5,666	.02	.30	16.11	81.66	1.45	.46
Southern	1,593	3.20	46.70	44.70	5.34	.06	.....
Pacific Coast	48	.....	.....	.....	.....	.....	(1)
Total	19,848	.53	12.97	23.64	60.23	1.19	1.44

[1] Not given on account of the small number involved.

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A comparison of the relative earnings in the different districts may, however, be more readily made from the summary in the form of cumulative percentages which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—LABORERS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—				
		Under 12 cents.	Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.
New England	341	.....	.....	53.67	95.31	100.00
Eastern	1,374	2.06	36.18	92.37	98.99	99.84
Pittsburgh	10,326	.14	11.51	29.25	96.80	97.98
Great Lakes and Middle West	5,666	.02	.32	16.43	98.09	99.54
Southern	1,593	3.20	49.91	94.60	99.94	100.00
Pacific Coast	48	.....	.....	.....	.....	(1)
Total	19,848	.53	13.50	37.14	97.37	98.56

[1] Not given on account of the small number involved.

MACHINISTS.

Data relative to the earnings and hours of labor were reported for 5,405 machinists. The larger part of these machinists were employed in the shops, but a considerable proportion were employed in making mechanical repairs in the various producing departments. The earnings of 82.66 per cent were 25 and under 40 cents per hour. Only 2.72 per cent of the machinists earned as much as 40 cents per hour, while 14.62 per cent earned less than 25 cents per hour. The earnings of the machinists, in common with most of the other skilled occupations, were decidedly lowest in the Eastern district as compared with the other principal districts. In the Eastern district 75.71 per cent of the machinists were hired at a rate of less than 30 cents per hour, while in the three other principal districts approximately 60 per cent of the machinists were paid 30 cents or more per hour. The relatively high level of earnings of machinists in the Southern district is particularly noticeable, the earnings in this district being on approximately the same level with the Pittsburgh and the Great Lakes and Middle West districts.

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The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—MACHINISTS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.					
		Under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 cents and over.
New England	172	.....	.....	29	118	23	2
Eastern	844	6	15	212	406	203	2
Pittsburgh	2,358	1	11	330	518	1,398	100
Great Lakes and Middle West	1,717	1	2	135	541	997	41
Southern	311	18	2	28	73	188	2
Pacific Coast	3	.....	.....	.....	1	2	.....
Total	5,405	26	30	734	1,657	2,811	147

PER CENT.

New England	172	.....	.....	16.86	68.60	13.37	1.16
Eastern	844	0.71	1.78	25.12	48.10	24.05	.24
Pittsburgh	2,358	.04	.47	13.99	21.97	59.29	4.24
Great Lakes and Middle West	1,717	.06	.12	7.86	31.51	58.07	2.39
Southern	311	5.79	.64	9.00	23.47	60.45	.64
Pacific Coast	3	.....	.....	.....	(1)	(1)	.....
Total	5,405	.48	.56	13.58	30.66	52.01	2.72

[1] Not given on account of the small number involved.

A comparison of the relative earnings in the separate districts can more easily be made from the summary in the form of cumulative percentages which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—MACHINISTS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—				
		Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.
New England	172	.....	.....	16.86	85.47	98.84
Eastern	844	0.71	2.49	27.61	75.71	99.76
Pittsburgh	2,358	.04	.51	14.50	36.47	95.76
Great Lakes and Middle West	1,717	.06	.17	8.04	39.55	97.61
Southern	311	5.79	6.43	15.43	38.91	99.36
Pacific Coast	3	.....	.....	.....	(1)	(1)
Total	5,406	.48	1.04	14.62	45.27	97.28

[1] Not given on account of the small number involved.

MACHINISTS' HELPERS.

Data relative to the earnings and hours of labor were reported for 2,459 machinists' helpers. This general classification includes workmen of all degrees of skill, some of the helpers who are necessarily included in this classification being in reality as highly skilled

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workmen as some of the machinists. The general level of earnings for machinists' helpers was highest in the Great Lakes and Middle West districts, where nearly two-thirds of the employees earned 18 cents or more per hour. There was very little difference between the wages paid in the Southern and Eastern districts, except that a somewhat larger proportion in the Southern district were paid less than 14 cents per hour.

The table which follows shows for each district the number and per cent of employees earning each classified amount per hour.

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—MACHINISTS' HELPERS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.					
		Under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 cents and over.
New England	39	.....	4	14	10	11	.....
Eastern	395	42	120	147	60	18	8
Pittsburgh	675	15	84	184	240	138	14
Great Lakes and Middle West	1,152	14	19	353	263	431	72
Southern	196	52	30	67	21	24	2
Pacific Coast	2	1	1	.....	.....	.....	.....
Total	2,459	124	258	765	594	622	96

PER CENT.

New England	39	.....	10.26	35.90	25.64	28.21	.....
Eastern	395	10.63	30.38	37.22	15.19	4.56	2.03
Pittsburgh	675	2.22	12.44	27.26	35.56	20.44	2.07
Great Lakes and Middle West	1,152	1.22	1.65	30.64	22.83	37.41	6.25
Southern	196	26.53	15.31	34.18	10.71	12.24	1.02
Pacific Coast	2	(1)	(1)	.....	.....	.....	.....
Total	2,459	5.04	10.49	31.11	24.16	25.29	3.90

[1] Not given on account of the small number involved.

A comparison of the relative earnings in the different districts can, however, be made more easily from the summary in the form of cumulative percentages which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—MACHINISTS' HELPERS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—				
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.
New England	39	.....	10.26	46.15	71.79	100.00
Eastern	395	10.63	41.01	78.23	93.42	97.97
Pittsburgh	675	2.22	14.67	41.93	77.48	97.93
Great Lakes and Middle West	1,152	1.22	2.86	33.51	56.34	93.75
Southern	196	26.53	41.84	76.02	86.73	98.98
Pacific Coast	2	(1)	(1)	(1)	(1)	(1)
Total	2,459	5.04	15.53	46.65	70.80	96.16

[1] Not given on account of the small number involved.

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MILLWRIGHTS.

Data relative to the earnings and hours of labor were reported for 1,066 millwrights. The duties of the millwrights, it may be remarked are concerned with the maintenance of the various machines and with the shafting, gears, etc., used for transmitting power to the machines. The earnings of 72.23 per cent of the millwrights were 20 and less than 30 cents per hour. There were, however, 24.67 per cent who earned 30 cents or more per hour and only 3.10 per cent who earned less than 20 cents per hour. The relative earnings of millwrights were highest in the Great Lakes and Middle West district, where 85.90 per cent of the employees earned 25 cents or more per hour. The earnings were lowest in the Eastern district, where 45.35 per cent of the employees earned less than 25 cents per hour.

The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—MILLWRIGHTS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.					
		Under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 cents and over.
New England	10	.....	.....	2	5	2	1
Eastern	86	3	3	33	29	18	.....
Pittsburgh	703	1	17	231	292	156	6
Great Lakes and Middle West	234	.....	8	25	143	57	1
Southern	32	.....	1	6	4	20	1
Pacific Coast	1	.....	.....	.....	.....	.....	1
Total	1,066	4	29	297	473	253	10

PER CENT.

New England	10	.....	.....	(1)	(1)	(1)	(1)
Eastern	86	3.49	3.49	38.37	33.72	20.96	.....
Pittsburgh	703	.14	2.42	32.86	41.54	22.19	0.85
Great Lakes and Middle West	234	.....	3.42	10.68	61.11	24.36	.43
Southern	32	.....	3.13	18.75	12.50	62.50	3.13
Pacific Coast	1	.....	.....	.....	.....	.....	(1)
Total	1,066	.38	2.72	27.86	44.37	23.73	.94

[1] Not given on account of the small number involved.

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A comparison of the relative earnings in the various departments can most easily be made from the summary in the form of cumulative percentages which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—MILLWRIGHTS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—				
		Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.
New England	10	.....	.....	[1]	[1]	[1]
Eastern	86	3.49	6.98	45.35	79.07	100.00
Pittsburgh	703	.14	2.56	35.42	76.96	99.15
Great Lakes and Middle West	224	.....	3.42	14.10	75.21	99.57
Southern	32	.....	3.13	21.88	34.38	96.88
Pacific Coast	1	.....	.....	.....	.....	[1]
Total	1,066	.38	3.10	30.96	75.33	99.06

[1] Not given on account of the small number involved.

MILLWRIGHTS' HELPERS.

Data relative to the earnings and hours of labor were reported for 845 employees classed as millwrights' helpers. A large part of these helpers were nothing more or less than common laborers whose duties were to carry tools and to do various other unskilled tasks as required by the millwrights. A considerable proportion, however, were somewhat skilled, as is shown by the fact that approximately 39 per cent earned 20 cents or more per hour.

The table which follows shows for each district the number and per cent of employees earning each classified amount per hour.

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—MILLWRIGHTS' HELPERS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.					
		Under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 cents and over.
New England	4	.....	.....	1	2	1	.....
Eastern	40	2	5	20	6	7	.....
Pittsburgh	593	5	5	149	168	256	10
Great Lakes and Middle West	159	.....	.....	42	80	31	6
Southern	49	.....	3	27	.....	19	.....
Total	845	7	13	239	256	314	16

PER CENT.

New England	4	.....	.....	[1]	[1]	[1]	.....
Eastern	40	5.00	12.50	50.00	15.00	17.50	.....
Pittsburgh	593	.84	.84	25.13	28.33	43.17	1.69
Great Lakes and Middle West	159	.....	.....	26.42	50.31	19.50	3.77
Southern	49	.....	6.12	55.10	.....	38.78	.....
Total	845	.83	1.54	28.28	30.30	37.16	1.89

[1] Not given on account of the small number involved.

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A comparison of the relative earnings in the different districts can, however, be more easily made from the summary in the form of cumulative percentages which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—MILLWRIGHTS' HELPERS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—				
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.
New England	4	.....	.....	(1)	(1)	(1)
Eastern	40	5.00	17.50	67.50	82.50	100.00
Pittsburgh	593	.84	1.69	26.81	55.14	98.31
Great Lakes and Middle West	159	.....	.....	26.42	76.73	96.23
Southern	49	.....	6.12	61.22	61.22	100.00
Total	845	.83	2.37	30.65	60.95	98.11

[1] Not given on account of the small number involved.

OILERS AND WIPERS.

Data relative to the earnings and hours of labor were reported for 1,992 employees classed as oilers and wipers. A large part of these oilers and wipers are boys of about 16 years or more, but a small number are sufficiently skilled so that they can assist the engineer in performing a number of his duties and can take charge of the operation of the engine during a short period when it is necessary to relieve him. More than three-fourths, 77.46 per cent, of the oilers and wipers earned 16 and less than 20 cents per hour. There were, however, 12.10 per cent who earned 20 cents or more per hour, while 10.44 per cent earned less than 16 cents per hour. The earnings of this class of employees were decidedly lowest in the Southern district, where 82.86 per cent earned less than 16 cents per hour.

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The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—OILERS AND WIPERS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.					
		Under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 cents and over.
New England	25	.....	8	9	3	3	2
Eastern	155	21	34	63	28	8	1
Pittsburgh	938	12	27	421	344	128	6
Great Lakes and Middle West	768	2	17	467	192	79	11
Southern	105	42	45	15	1	2	.....
Pacific Coast	1	.....	.....	.....	.....	.....	1
Total	1,992	77	131	975	568	220	21

PER CENT.

New England	25	.....	32.00	36.00	12.00	12.00	8.00
Eastern	155	13.55	21.94	40.65	18.06	5.16	.65
Pittsburgh	938	1.28	2.88	44.88	36.67	13.65	.64
Great Lakes and Middle West	768	.26	2.21	60.81	25.00	10.29	1.43
Southern	105	40.00	42.86	14.29	.95	1.90	.....
Pacific Coast	1	.....	.....	.....	.....	.....	[1]
Total	1,992	3.87	6.58	48.95	28.51	11.04	1.05

[1] Not given on account of the small number involved.

A comparison of the relative earnings in the various districts may, however, be more easily made from the summary in the form of cumulative percentages which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—OILERS AND WIPERS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—				
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.
New England	25	.....	32.00	68.00	80.00	92.00
Eastern	155	13.55	35.48	76.13	94.19	99.35
Pittsburgh	938	1.28	4.16	49.04	85.71	99.36
Great Lakes and Middle West	768	.26	2.47	63.28	88.28	98.57
Southern	105	40.00	82.86	97.14	98.10	100.00
Pacific Coast	1	.....	.....	.....	.....	[1]
Total	1,992	3.87	10.44	59.39	87.90	98.95

[1] Not given on account of the small number involved.

PIPE FITTERS.

Data relative to the earnings and hours of labor were reported for 1,034 pipe fitters. The earnings of 73.21 per cent, or nearly three-fourths of the pipe fitters, were 20 and less than 30 cents per hour. Less than one-half of 1 per cent of the pipe fitters earned as much as

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40 cents per hour, while 4.74 per cent earned less than 20 cents per hour. The general level of earnings of pipe fitters was highest in the Great Lakes and Middle West district, where 81.85 per cent of the pipe fitters earned 25 cents or more per hour.

The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—PIPE FITTERS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.					
		Under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 cents and over.
New England	18	.....	.....	2	14	2	.....
Eastern	142	3	5	77	51	6	.....
Pittsburgh	500	2	17	134	236	108	3
Great Lakes and Middle West	325	10	4	45	165	99	2
Southern	48	5	3	8	25	7	.....
Pacific Coast	1	.....	.....	.....	.....	1	.....
Total	1,034	20	29	266	491	223	5

PER CENT.

New England	18	.....	.....	11.11	77.78	11.11	.....
Eastern	142	2.11	3.52	54.23	35.92	4.23	.....
Pittsburgh	500	.40	3.40	26.80	47.20	21.60	0.60
Great Lakes and Middle West	325	3.08	1.23	13.85	50.77	30.46	.62
Southern	48	10.42	6.25	16.67	52.08	14.58	.....
Pacific Coast	1	.....	.....	.....	.....	(1)	.....
Total	1,034	1.93	2.80	25.73	47.49	21.57	.48

[1] Not given on account of the small number involved.

A comparison of the relative earnings in the different districts, may, however, be more easily made from the summary in the form of cumulative percentages which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—PIPE FITTERS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—				
		Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.
New England	18	.....	.....	11.11	88.89	100.00
Eastern	142	2.11	5.63	59.86	95.77	100.00
Pittsburgh	500	.40	3.80	30.60	77.80	99.40
Great Lakes and Middle West	325	3.08	4.31	18.15	68.92	99.38
Southern	48	10.42	16.67	33.33	85.42	100.00
Pacific Coast	1	.....	.....	.....	.....	(1)
Total	1,034	1.93	4.74	30.46	77.95	99.52

[1] Not given on account of the small number involved.

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RIGGERS.

Data relative to the earnings and hours of labor were reported for 1,887 riggers. The duties of the riggers or "sailors," as they are sometimes known, consist in the repairing of roofs, painting of stacks, and similar repairs as are made on overhead structures where a great deal of climbing is necessary. This classification includes workmen of various degrees of skill, as is indicated by the comparatively wide range of earnings reported. The general level of earnings for this class of employees was lowest in the Pittsburgh district where 44.51 per cent of the riggers earned less than 18 cents per hour. It is probable, however, that in this district a number of common laborers who were merely helpers to the riggers were classed as riggers.

The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—RIGGERS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.					
		Under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 cents and over.
New England	11	.....	.....	.....	10	.....	1
Eastern	155	13	32	15	46	42	7
Pittsburgh	993	401	41	193	224	122	12
Great Lakes and Middle West	658	1	37	106	451	57	6
Southern	70	.....	.....	18	46	6	.....
Total	1,887	415	110	332	777	227	26

PER CENT.

New England	11	.....	.....	.....	(1)	.....	(1)
Eastern	155	8.39	20.65	9.68	29.68	27.10	4.52
Pittsburgh	993	40.38	4.13	19.44	12.29	22.56	1.21
Great Lakes and Middle West	658	.15	5.62	16.11	68.54	8.06	.91
Southern	70	.....	.....	25.71	65.71	8.57	.....
Total	1,887	21.99	5.83	17.59	41.18	12.03	1.38

[1] Not given on account of the small number involved.

A comparison of the relative earnings in each of the separate districts may, however, be more easily made from the summary in the form of cumulative percentages which follows:

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PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—RIGGERS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—				
		Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.
New England	11	.....	.....	.....	(1)	(1)
Eastern	155	8.39	29.03	38.71	68.39	95.48
Pittsburgh	993	40.38	44.51	63.95	76.23	98.79
Great Lakes and Middle West	658	.15	5.78	21.88	90.43	99.09
Southern	70	.....	.....	25.71	91.43	100.00
Total	1,887	21.99	27.82	45.42	86.59	98.62

[1] Not given on account of the small number involved.

ROLL TURNERS.

Data relative to the earnings and hours of labor were reported for 715 roll turners. Roll turners, it should be understood, are in reality very highly skilled and specialized machinists, whose work consists in forming and finishing the rolls used in the various types of rolling mills. The larger part of roll turners, 68.53 per cent, earned 30 and less than 40 cents per hour. There were, however, 4.62 per cent who earned 50 cents or more per hour, while only 6.43 per cent earned less than 25 cents per hour. The general level of earnings of the roll turners was lowest in the Eastern district and highest in the Pittsburgh district. The number of employees in the New England and Southern districts was so small that a comparison is impossible.

The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—ROLL TURNERS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount.					
		Under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 and under 60 cents.	60 cents and over.
New England	15	4	7	2	1	1	.....
Eastern	120	22	16	58	15	7	2
Pittsburgh	361	13	31	266	38	7	6
Great Lakes and Middle West	196	7	27	148	6	4	4
Southern	22	.....	.....	16	5	1	.....
Pacific Coast	1	.....	.....	.....	.....	1	.....
Total	715	46	81	490	65	21	12

PER CENT.

New England	15	(1)	(1)	(1)	(1)	(1)	.....
Eastern	120	18.33	13.33	48.33	12.50	5.83	1.67
Pittsburgh	361	3.60	8.59	73.69	10.53	1.94	1.66
Great Lakes and Middle West	196	3.57	13.78	75.51	3.06	2.04	2.04
Southern	22	.....	.....	72.73	22.73	4.55	.....
Pacific Coast	1	.....	.....	.....	.....	(1)	.....
Total	715	6.43	11.33	68.53	9.09	2.94	1.68

[1] Not given on account of the small number involved.

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A comparison of the relative earnings in each of the separate districts may, however, be more easily made from the summary in the form of cumulative percentages which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—ROLL TURNERS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—				
		Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.	Under 60 cents.
New England	15	(1)	(1)	(1)	(1)	(1)
Eastern	120	18.33	31.67	80.00	92.50	98.33
Pittsburgh	361	3.60	12.19	85.87	96.40	98.34
Great Lakes and Middle West	196	3.57	17.35	92.86	95.92	97.96
Southern	22	.....	.....	72.73	95.45	100.00
Pacific Coast	1	.....	.....	.....	.....	(1)
Total	715	6.43	17.76	86.29	95.38	98.32

[1] Not given on account of the small number involved.

CUSTOMARY WORKING HOURS PER WEEK.

The hours of labor of the employees in nonproductive occupations show wide variations. They are in fact very much less uniform than in the productive occupations, where it is the custom for by far the larger number of employees to work 12 hours per day and where the only alternative in case of the continuous operation of the department is the 8-hour day. These wide variations between the different nonproductive occupations may be clearly seen by an inspection of the table which follows. This table shows for each of the principal occupations the number and per cent of employees working each classified number of hours per week. The details upon which this table is based are shown for each separate plant in Table III of Volume II of this report.

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NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY OCCUPATIONS—ALL DISTRICTS.

NUMBER.

Occupations.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Blacksmiths	1,287	.....	64	152	674	207	85	50	43	12
Blacksmiths' helpers	1,662	.....	61	159	889	294	120	77	48	14
Boiler makers	786	.....	5	101	551	101	6	6	16	.....
Boiler makers' helpers	995	.....	.....	87	749	129	5	5	18	2
Brakemen, conductors, and switchmen	1,831	.....	.....	7	55	263	378	355	773	.....
Bricklayers	1,450	117	73	199	773	135	48	49	56	.....
Bricklayers' helpers	1,288	1	31	135	893	142	4	81	1	.....
Carpenters	1,960	4	85	253	1,345	255	5	4	8	1
Electricians	1,008	.....	13	61	215	195	145	94	269	16
Engineers, yard locomotive	1,359	6	2	1	27	151	369	283	520	.....
Firemen, stationary	2,829	.....	11	23	68	356	408	256	1,704	3
Gasmen	1,970	.....	2	12	17	113	220	370	1,234	2
Laborers	19,848	.....	652	2,896	8,965	3,234	2,807	498	775	21
Machinists	5,405	2	405	604	2,384	1,089	450	268	135	48
Machinists' helpers	2,459	3	118	187	1,286	570	98	99	86	12
Millwrights	1,066	.....	34	23	204	164	227	106	304	4
Millwrights' helpers	845	.....	31	19	83	98	160	158	293	3
Oilers and wipers	1,992	3	4	17	89	229	375	118	1,148	9
Pipe fitters	1,034	.....	25	125	460	227	43	37	102	15
Riggers	1,887	.....	16	105	709	742	113	107	92	3
Roll turners	715	1	56	60	365	178	19	36	.....	.....
All other occupations	27,567	119	911	2,390	8,400	4,321	4,560	1,420	5,323	123
Total	81,243	256	2,599	7,616	29,201	13,193	10,645	4,497	12,948	288

PER CENT.

Blacksmiths	1,287	.....	4.97	11.81	52.37	16.08	6.60	3.89	3.34	0.93
Blacksmiths' helpers	1,662	.....	3.67	9.57	53.49	17.69	7.22	4.63	2.89	.84
Boiler makers	786	.....	.64	12.85	70.10	12.85	.76	.76	2.04	.....
Boiler makers' helpers	995	.....	.....	8.74	75.28	12.96	.50	.50	1.81	.20
Brakemen, conductors, and switchmen	1,831	.....	.....	.38	3.00	14.36	20.64	19.39	42.22	.....
Bricklayers	1,450	8.07	5.03	13.72	53.31	9.31	3.31	3.38	3.86	.....
Bricklayers' helpers	1,288	.08	2.41	10.48	69.33	11.02	.31	6.29	.08	.....
Carpenters	1,960	.20	4.34	12.91	68.62	13.01	.26	.20	.41	.05
Electricians	1,008	.....	1.29	6.05	21.33	19.35	14.38	9.33	26.69	1.59
Engineers, yard locomotive	1,359	.44	.15	.07	1.99	11.11	27.15	20.82	38.26	.....
Firemen, stationary	2,829	.....	.39	.81	2.40	12.58	14.42	9.05	60.23	.11
Gasmen	1,970	.....	.10	.61	.86	5.74	11.17	18.78	62.64	.10
Laborers	19,848	.....	3.28	14.59	45.17	16.29	14.14	2.51	3.90	.11
Machinists	5,405	.04	7.49	11.17	44.11	20.15	8.33	5.33	2.50	.89
Machinists' helpers	2,459	.12	4.80	7.60	52.30	23.18	3.99	4.03	3.50	.49
Millwrights	1,066	.....	3.19	2.16	19.14	15.38	21.29	9.94	28.52	.38
Millwrights' helpers	845	.....	3.67	2.25	9.82	11.60	18.93	18.70	34.67	.36
Oilers and wipers	1,992	.15	.20	.85	4.47	11.50	18.83	5.92	57.63	.45
Pipe fitters	1,034	.....	2.42	12.09	44.49	21.95	4.16	3.58	9.86	1.45
Riggers	1,887	.....	.85	5.56	37.57	39.32	5.99	5.67	4.88	.16
Roll turners	715	.14	7.83	8.39	51.05	24.90	2.66	5.03	.....	.....
All other occupations	27,567	.43	3.30	8.67	30.47	15.67	16.54	5.15	19.31	.45
Total	81,243	.32	3.20	9.37	35.94	16.24	13.10	5.54	15.94	.35

Of the 21 principal occupations shown in the above table there are 3 in which more than 50 per cent of the employees customarily worked 84 hours and over per week and 8 in which more than 25 per cent customarily worked 84 hours and over per week. On the other hand, there are 12 occupations in which at least 50 per cent of the employees customarily worked 60 hours or less per week. In only one of these principal occupations, however, do as many as 10 per cent of the employees have a working week of less than 56 hours. The standard working week for most of the occupations

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shown here was of 60 hours, which is, in effect, the 10-hour day for 6 days per week. The 3 occupations in which 84 hours was the standard working week were the gasmen, firemen, stationary, and oilers and wipers, in each of which occupations more than 50 per cent of the employees were shown to be working 84 hours or more per week. The occupation in which the shortest hours of labor were reported was that of the bricklayers, where 26.82 per cent were reported as working less than 60 hours per week. This occupation, it may be further remarked, was the only one in which any considerable proportion of the employees had a working week of 48 hours or less. The true significance of this fact, however, is not appreciated until it is remembered that in practically all of the larger cities the bricklayers in the building trades have secured a standard working week of 48 hours, while in the steel industry only 8.07 per cent were working as few as 48 hours per week. The same situation, when compared with the working hours outside the steel industry, is found for practically all of the other skilled occupations shown above. Less than one-fifth of the employees in any occupation except that of bricklayers are shown to be working less than 60 hours per week, while practically all of these trades have succeeded in obtaining a working day of 9 hours or less in practically every part of the country where they are employed outside of the steel industry.

For purposes of reference the following table is presented, which shows for each district the number of employees in each occupation working each classified number of hours per week.

NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS.

NEW ENGLAND DISTRICT.

Occupations.	Normal number of employees.	Number of employees whose customary working hours were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Blacksmiths	47	.....	2	8	36	1	.....	.....	.....	.....
Blacksmiths' helpers	56	.....	2	9	44	1	.....	.....	.....	.....
Boiler makers	2	.....	.....	.....	2	.....	.....	.....	.....	.....
Boiler makers' helpers	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brakemen, conductors, and switchmen	25	.....	.....	.....	3	13	.....	5	4	.....
Bricklayers	39	10	1	.....	24	2	.....	2	.....	.....
Bricklayers' helpers	50	.....	.....	.....	45	3	.....	2	.....	.....
Carpenters	62	.....	2	.....	60	.....	.....	.....	.....	.....
Electricians	38	.....	.....	.....	28	5	1	2	.....	2
Engineers, yard locomotive	27	.....	.....	.....	2	14	.....	5	6	.....
Firemen, stationary	80	.....	.....	2	5	40	1	4	28	.....
Gasmen	43	.....	.....	.....	.....	20	.....	19	4	.....
Laborers	341	.....	.....	.....	338	2	.....	.....	.....	1
Machinists	172	.....	12	.....	146	13	1	.....	.....	.....
Machinists' helpers	39	.....	3	.....	32	4	.....	.....	.....	.....
Millwrights	10	.....	.....	.....	5	1	.....	3	1	.....
Millwrights' helpers	4	.....	.....	.....	2	2	.....	.....	.....	.....
Oilers and wipers	25	.....	.....	.....	11	7	2	1	4	.....
Pipe fitters	18	.....	1	.....	13	.....	.....	2	.....	2
Riggers	11	.....	.....	.....	11	.....	.....	.....	.....	.....
Roll turners	15	.....	1	.....	13	1	.....	.....	.....	.....
All other occupations	483	.....	17	44	299	40	32	7	41	3
Total	1,587	10	41	63	1,119	169	37	52	88	8

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NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—Continued.

EASTERN DISTRICT.

Occupations.	Normal number of employees.	Number of employees whose customary working hours were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Blacksmiths	209	.....	33	35	105	21	5	8	2	.....
Blacksmiths' helpers	253	.....	45	26	130	26	10	11	5	.....
Boiler makers	67	.....	3	1	63	.....	.....	.....	.....	.....
Boiler makers' helpers	63	.....	.....	.....	63	.....	.....	.....	.....	.....
Brakemen, conductors, and switchmen	285	.....	.....	6	5	125	18	45	86	.....
Bricklayers	267	.....	36	38	89	45	5	1	53	.....
Bricklayers' helpers	258	.....	20	17	191	29	.....	1	.....	.....
Carpenters	197	.....	28	26	125	17	1	.....	.....	.....
Electricians	120	.....	10	38	37	15	2	9	8	1
Engineers, yard locomotive	183	.....	1	1	6	63	9	33	70	.....
Firemen, stationary	433	.....	.....	11	17	125	23	33	223	1
Gasmen	525	.....	2	12	9	47	67	97	289	2
Laborers	1,874	.....	207	494	943	77	23	111	16	3
Machinists	844	1	141	170	368	114	8	14	23	5
Machinists' helpers	395	3	22	41	158	130	.....	19	22	.....
Millwrights	86	.....	21	9	15	14	19	1	7	.....
Millwrights' helpers	40	.....	20	2	6	.....	5	2	5	.....
Oilers and wipers	155	.....	2	1	7	58	12	7	68	.....
Pipe fitters	142	.....	13	54	44	17	1	1	9	3
Riggers	155	.....	16	47	37	7	.....	31	17	.....
Roll turners	120	.....	34	12	44	30	.....	.....	.....	.....
All other occupations	3,585	17	491	636	834	617	428	116	429	17
Total	10,256	21	1,145	1,677	3,296	1,577	636	540	1,332	32

PITTSBURGH DISTRICT.

Blacksmiths	609	.....	16	88	304	84	52	37	18	10
Blacksmiths' helpers	769	.....	7	107	395	106	68	59	15	12
Boiler makers	373	.....	2	100	202	44	6	6	13	.....
Boiler makers' helpers	390	.....	.....	87	234	51	5	5	6	2
Brakemen, conductors, and switchmen	1,069	.....	.....	1	42	97	224	279	446	.....
Bricklayers	531	47	20	116	232	31	40	45	.....	.....
Bricklayers' helpers	606	.....	5	117	383	22	1	78	.....	.....
Carpenters	764	.....	40	198	422	100	1	2	.....	1
Electricians	413	.....	3	12	23	85	78	63	141	8
Engineers, yard locomotive	741	6	1	.....	15	40	206	223	250	.....
Firemen, stationary	1,205	.....	3	10	15	108	206	149	713	1
Gasmen	692	.....	.....	.....	.....	32	67	201	392	.....
Laborers	10,326	.....	420	1,626	3,741	1,939	1,606	378	614	2
Machinists	2,358	1	179	327	888	368	304	206	44	41
Machinists' helpers	675	.....	83	100	240	141	37	56	12	6
Millwrights	703	.....	10	14	155	106	142	92	181	3
Millwrights' helpers	593	.....	11	17	56	68	104	145	191	1
Oilers and wipers	938	3	2	11	54	86	170	83	522	7
Pipe fitters	500	.....	11	63	238	98	15	26	41	8
Riggers	993	.....	.....	57	299	517	38	53	28	1
Roll turners	361	.....	15	41	179	90	3	33	.....	.....
All other occupations	14,421	51	321	1,489	3,894	2,007	2,702	1,073	2,832	52
Total	40,050	108	1,149	4,581	12,011	6,220	6,075	3,292	6,459	155

GREAT LAKES AND MIDDLE WEST DISTRICT.

Blacksmiths	347	.....	13	16	194	77	20	4	21	2
Blacksmiths' helpers	471	.....	7	7	274	125	25	7	24	2
Boiler makers	300	.....	.....	.....	245	52	.....	.....	3	.....
Boiler makers' helpers	459	.....	.....	.....	380	67	.....	.....	12	.....
Brakemen, conductors, and switchmen	325	.....	.....	.....	4	8	117	24	172	.....
Bricklayers	489	47	1	42	338	54	3	1	3	.....
Bricklayers' helpers	315	1	3	.....	265	42	3	.....	1	.....
Carpenters	707	.....	15	13	541	127	2	2	7	.....
Electricians	404	.....	.....	11	127	84	60	19	99	4
Engineers, yard locomotive	300	.....	.....	.....	4	8	132	20	136	.....
Firemen, stationary	891	.....	8	.....	21	78	146	70	567	1
Gasmen	568	.....	.....	.....	8	12	78	53	437	.....
Laborers	5,066	.....	25	356	2,776	1,173	1,174	9	145	8

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NUMBER OF EMPLOYEES IN EACH OCCUPATION WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—Concluded.

GREAT LAKES AND MIDDLE WEST DISTRICT—Concluded.

Occupations.	Normal number of employees.	Number of employees whose customary working hours were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Machinists	1,717	.....	73	63	839	547	62	67	64	2
Machinists' helpers	1,152	.....	10	18	752	242	57	23	44	6
Millwrights	234	.....	3	.....	22	41	54	10	103	1
Millwrights' helpers	159	.....	.....	.....	17	10	44	11	75	2
Oilers and wipers	768	.....	.....	4	14	72	173	27	476	2
Pipe fitters	325	.....	.....	7	138	98	22	8	50	2
Riggers	658	.....	.....	1	293	218	74	23	47	2
Roll turners	196	1	6	4	121	57	4	3	.....	.....
All other occupations	7,581	51	70	147	2,763	1,410	1,213	217	1,659	51
Total	24,052	100	234	689	10,136	4,602	3,463	598	4,145	85

SOUTHERN DISTRICT.

Blacksmiths	74	.....	.....	4	35	24	8	1	2	.....
Blacksmiths' helpers	112	.....	.....	9	46	36	17	.....	4	.....
Boiler makers	44	.....	.....	.....	39	5	.....	.....	.....	.....
Boiler makers' helpers	83	.....	.....	.....	72	11	.....	.....	.....	.....
Brakemen, conductors, and switchmen	107	.....	.....	.....	1	20	19	2	65	.....
Bricklayers	122	12	15	3	90	2	.....	.....	.....	.....
Bricklayers' helpers	58	.....	3	.....	9	46	.....	.....	.....	.....
Carpenters	229	4	.....	15	197	11	1	.....	1	.....
Electricians	33	.....	.....	.....	.....	6	4	1	21	1
Engineers, yard locomotive	108	.....	.....	.....	.....	26	22	2	58	.....
Firemen, stationary	217	.....	.....	.....	10	5	32	.....	170	.....
Gasmen	122	.....	.....	.....	.....	2	8	.....	112	.....
Laborers	1,593	.....	.....	372	1,167	43	4	.....	.....	7
Machinists	311	.....	.....	41	143	47	75	1	4	.....
Machinists' helpers	196	.....	.....	26	104	53	4	1	8	.....
Millwrights	32	.....	.....	.....	7	1	12	.....	12	.....
Millwrights' helpers	49	.....	.....	.....	2	18	7	.....	22	.....
Oilers and wipers	105	.....	.....	.....	3	6	18	.....	78	.....
Pipe fitters	48	.....	.....	.....	27	14	5	.....	2	.....
Riggers	70	.....	.....	.....	69	.....	1	.....	.....	.....
Roll turners	22	.....	.....	2	8	.....	12	.....	.....	.....
All other occupations	1,463	.....	.....	52	610	247	185	7	362	.....
Total	5,198	16	18	524	2,639	623	434	15	921	8

PACIFIC COAST DISTRICT.

Blacksmiths	1	.....	.....	1	.....	.....	.....	.....	.....	.....
Blacksmiths' helpers	1	.....	.....	1	.....	.....	.....	.....	.....	.....
Boiler makers	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Boiler makers' helpers	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brakemen, conductors, and switchmen	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bricklayers	2	1	.....	.....	.....	1	.....	.....	.....	.....
Bricklayers' helpers	1	.....	.....	1	.....	.....	.....	.....	.....	.....
Carpenters	1	.....	.....	1	.....	.....	.....	.....	.....	.....
Electricians	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Engineers, yard locomotive	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Firemen, stationary	3	.....	.....	.....	.....	.....	.....	.....	3	.....
Gasmen	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Laborers	48	.....	.....	48	.....	.....	.....	.....	.....	.....
Machinists	3	.....	.....	3	.....	.....	.....	.....	.....	.....
Machinists' helpers	2	.....	.....	2	.....	.....	.....	.....	.....	.....
Millwrights	1	.....	.....	.....	.....	1	.....	.....	.....	.....
Millwrights' helpers	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oilers and wipers	1	.....	.....	1	.....	.....	.....	.....	.....	.....
Pipe fitters	1	.....	.....	1	.....	.....	.....	.....	.....	.....
Riggers	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Roll turners	1	.....	.....	1	.....	.....	.....	.....	.....	.....
All other occupations	34	.....	12	22	.....	.....	.....	.....	.....	.....
Total	100	1	12	82	.....	2	.....	.....	3	.....

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BLACKSMITHS.

The customary working hours for the majority of blacksmiths in practically every district were 60 hours per week. There were, however, a larger proportion of the blacksmiths for the country as a whole working more than 60 hours than working less than 60 hours per week. The hours of blacksmiths, however, were not constant in the different districts as is shown by the table which follows. This table shows for each district the number and per cent of employees working each classified number of hours per week.

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—BLACKSMITHS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—							
		Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	47	2	8	36	1	.....	.....	.....	.....
Eastern	209	33	35	105	21	5	8	2	.....
Pittsburgh	609	16	88	304	84	52	37	18	10
Great Lakes and Middle West	347	13	16	194	77	20	4	21	2
Southern	74	.....	4	35	24	8	1	2	.....
Pacific Coast	1	.....	1	.....	.....	.....	.....	.....	.....
Total	1,287	64	152	674	207	85	50	43	12

PER CENT.

New England	47	4.26	17.02	76.60	2.13	.....	.....	.....	.....
Eastern	209	15.79	16.75	50.24	10.05	2.39	3.83	0.96	.....
Pittsburgh	609	2.63	14.45	49.92	13.79	8.54	6.08	2.96	1.64
Great Lakes and Middle West	347	3.75	4.61	55.91	22.19	5.76	1.15	6.05	.58
Southern	74	.....	5.41	47.30	32.43	10.81	1.35	2.70	.....
Pacific Coast	1	.....	(1)	.....	.....	.....	.....	.....	.....
Total	1,287	4.97	11.81	52.37	16.08	6.60	3.89	3.34	.93

[1] Not given on account of the small number involved.

In each of four districts it will be seen from the above table some of the blacksmiths were working 84 hours and over, although in no case did this proportion amount to more than 7 per cent of the total number. The chief variation between the different districts is to be found in the three columns which include all employees working 56 and less than 72 hours per week, the differences being influenced chiefly by whether the blacksmiths in the particular district had a 9, 10, or 11 hour day. The working hours were on a whole the longest in the Southern district, where almost one-half of the employees were reported as working more than 60 hours per week.

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BLACKSMITHS' HELPERS.

The hours of labor for blacksmiths' helpers were, as might be expected, almost exactly identical with the hours reported for the blacksmiths, as these two sets of workmen must necessarily have approximately the same working hours. The variations shown are influenced in a large part by the proportion of the number of blacksmiths' helpers to blacksmiths in each of the districts. For example, if in a particular district the proportion of helpers to blacksmiths in an establishment which is working 84 hours per week is as two to one, this will make the relative hours of the blacksmiths' helpers apparently longer than for the blacksmiths when the figures following the entire district are assembled.

The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—BLACKSMITHS' HELPERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—							
		Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	56	2	9	44	1	.....	.....	.....	.....
Eastern	253	45	26	130	26	10	11	5	.....
Pittsburgh	769	7	107	395	106	68	59	15	12
Great Lakes and Middle West	471	7	7	274	125	25	7	24	2
Southern	112	.....	9	46	36	17	.....	4	.....
Pacific Coast	1	.....	1	.....	.....	.....	.....	.....	.....
Total	1,662	61	159	889	294	120	77	48	14

PER CENT.

New England	56	3.57	16.07	78.57	1.79	.....	.....	.....	.....
Eastern	253	17.79	10.28	51.38	10.28	3.95	4.35	1.98	.....
Pittsburgh	769	.91	13.91	51.37	13.78	8.84	7.67	1.95	1.56
Great Lakes and Middle West	471	1.49	1.49	58.17	26.54	5.31	1.49	5.10	.42
Southern	112	.....	8.04	41.07	32.14	15.18	.....	3.57	.....
Pacific Coast	1	.....	(1)	.....	.....	.....	.....	.....	.....
Total	1,662	3.67	9.57	53.49	17.69	7.22	4.63	2.89	.84

[1] Not given on account of the small number involved.

BOILER MAKERS.

The customary working hours for boiler makers in each of the districts were 60 hours per week. There were, however, considerable variations between the working hours of this class of employees in the different districts, particularly as regards the large proportion, amounting to 27.35 per cent, in the Pittsburgh district, who have succeeded in securing a working week of less than 60 hours. In that district, how-

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ever, a small proportion of the boiler makers were working very long hours, there being 6.71 per cent who customarily worked 72 hours or more per week. In both the Pittsburgh and the Great Lakes and Middle West districts, which include by far the larger part of the boiler makers, over 18 per cent worked more than 60 hours per week.

The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK BY DISTRICTS—BOILER MAKERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—						
		Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.
New England	2	.....	.....	2	.....	.....	.....	.....
Eastern	67	3	1	63	.....	.....	.....	.....
Pittsburgh	373	2	100	202	44	6	6	13
Great Lakes and Middle West	300	.....	.....	245	52	.....	.....	3
Southern	44	.....	.....	39	5	.....	.....	.....
Total	786	5	101	551	101	6	6	16

PER CENT.

New England	2	.....	.....	100.00	.....	.....	.....	.....
Eastern	67	4.48	1.49	94.03	.....	.....	.....	.....
Pittsburgh	373	.54	26.81	54.16	11.80	1.61	1.61	3.49
Great Lakes and Middle West	300	.....	.....	81.67	17.33	.....	.....	1.00
Southern	44	.....	.....	88.64	11.36	.....	.....	.....
Total	786	.64	12.85	70.10	12.85	.76	.76	2.04

BOILER MAKERS' HELPERS.

The hours of labor for boiler makers' helpers were very nearly the same as for the boiler makers, the chief difference lying in the fact that none of the boiler makers' helpers were working less than 56 hours per week. This arises largely from the fact that the boiler makers' helpers, who were chiefly riveters and rivet heaters, necessarily began work somewhat earlier than the boiler makers in order to have the rivets hot and everything ready when the boiler makers were ready to begin work.

The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week.

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NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—BOILER MAKERS' HELPERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—						
		56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Eastern	63	.....	63	.....	.....	.....	.....	.....
Pittsburgh	390	87	234	51	5	5	6	2
Great Lakes and Middle West	459	.....	380	67	.....	.....	12	.....
Southern	83	.....	72	11	.....	.....	.....	.....
Total	995	87	749	129	5	5	18	2

PER CENT.

Eastern	63	.....	100.00	.....	.....	.....	.....	.....
Pittsburgh	390	22.31	60.00	13.08	1.28	1.28	1.54	0.51
Great Lakes and Middle West	459	.....	82.79	14.60	.....	.....	2.61	.....
Southern	83	.....	86.75	13.25	.....	.....	.....	.....
Total	995	8.74	75.28	12.96	.50	.50	1.81	.20

BRAKEMEN, CONDUCTORS, AND SWITCHMEN.

The function of the yard transportation system of the steel plant consists largely in conveying molten metal and partly finished material from one department of the plant to the other. This necessarily requires that the men employed in the yard transportation department work approximately the same hours as the men in the producing departments. For example, the transportation crew engaged in hauling hot metal from the blast furnace to the open-hearth or Bessemer department are necessarily on duty 84 hours per week, since the molten metal from the blast furnaces must be hauled away as soon as it is run into the ladles, whether it goes directly to the Bessemer or open-hearth department or into pigs at the casting machine. This fact accounts for the very large proportion, 42.22 per cent, of the brakemen, conductors, and switchmen who were reported as working 84 hours per week. It will be noted that the proportion working 84 hours per week is very much larger in the Great Lakes and Middle West and the Southern districts, where the proportion of blast furnaces is largest.

A number of the locomotive engineers are employed in handling materials solely for the shipping department, and in this case, of course, the hours of labor have no fixed limit. It may be said, therefore, that practically all of the brakemen, conductors, and switchmen reported as working less than 72 hours per week were employed in connection with the shipping department. The proportion working less than 72 hours per week is, of course, greatest in the New England and Eastern districts, where a very large proportion of the mills

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produce a finished product and where the shipping department is accordingly relatively large.

The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—BRAKEMEN, CONDUCTORS, AND SWITCHMEN.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—					
		56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.
New England	25	.....	3	13	.....	5	4
Eastern	285	6	5	125	18	45	86
Pittsburgh	1,089	1	42	97	224	279	446
Great Lakes and Middle West	325	.....	4	8	117	24	172
Southern	107	.....	1	20	19	2	65
Total	1,831	7	55	263	378	355	773

PER CENT.

New England	25	.....	12.00	52.00	.....	20.00	16.00
Eastern	285	2.11	1.75	43.86	6.32	15.79	30.18
Pittsburgh	1,089	.09	3.86	8.91	20.57	25.62	40.96
Great Lakes and Middle West	325	.....	1.23	2.46	36.00	7.38	52.92
Southern	107	.....	.93	18.69	17.76	1.87	60.75
Total	1,831	.38	3.00	14.36	20.64	19.39	42.22

BRICKLAYERS.

The customary working hours for the bricklayers in the steel industry were 60 hours per week, slightly more than one-half of the total number working that number of hours. Approximately one-fifth, 19.86 per cent, of the bricklayers, however, were reported as customarily working more than 60 hours per week, and slightly more than one-fourth, 26.82 per cent, were customarily working less than 60 hours per week. Less than 9 per cent, however, were reported as customarily working 48 hours per week or less. In connection with this statement it should be recalled that the bricklayers in the building trades in a large number of cities have secured a standard working week of 48 hours. Wide variations are shown to exist between the customary working hours for bricklayers in the different districts. In the Eastern district 19.85 per cent of the bricklayers were reported as working 84 hours per week. This is in decided contrast to the situation in the New England district, where 25.64 per cent of the bricklayers had a working week of 48 hours or less.

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The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—BRICKLAYERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—							
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.
New England	39	10	1	.....	24	2	.....	2	.....
Eastern	267	.....	36	38	89	45	5	1	53
Pittsburgh	531	47	20	116	232	31	40	45	.....
Great Lakes and Middle West	489	47	1	42	338	54	3	1	3
Southern	122	12	15	3	90	2	.....	.....	.....
Pacific Coast	2	1	.....	.....	.....	1	.....	.....	.....
Total	1,450	117	73	199	773	135	48	49	56

PER CENT.

New England	39	25.64	2.56	.....	61.54	5.13	.....	5.13	.....
Eastern	267	.....	13.48	14.23	33.33	16.85	1.87	.37	19.85
Pittsburgh	531	8.85	3.77	21.85	43.69	5.84	7.53	8.47	.....
Great Lakes and Middle West	489	9.61	.20	8.59	69.12	11.04	.61	.20	.61
Southern	122	9.84	12.30	2.46	73.77	1.64	.....	.....	.....
Pacific Coast	2	(1)	.....	.....	.....	(1)	.....	.....	.....
Total	1,450	8.07	5.03	13.72	53.31	9.31	3.31	3.38	3.86

[1] Not given on account of the small number involved.

BRICKLAYERS' HELPERS.

The customary working hours for bricklayers' helpers differ considerably from those reported for bricklayers. This is due almost entirely to the fact that in a few establishments in every district the bricklayers' helpers were not separately reported, but were either carried under the general head of laborers or in a very few cases were probably included with the bricklayers. The customary working hours for the bricklayers' helpers in four of the districts were 60 hours per week.

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The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—BRICKLAYERS' HELPERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—							
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.
New England	50	.....	.....	.....	45	3	.....	2	.....
Eastern	258	.....	20	17	191	29	.....	1	.....
Pittsburgh	606	.....	5	117	383	22	1	78	.....
Great Lakes and Middle West	315	1	3	.....	265	42	3	.....	1
Southern	58	.....	3	.....	9	46	.....	.....	.....
Pacific Coast	1	.....	.....	1	.....	.....	.....	.....	.....
Total	1,288	1	31	135	893	142	4	81	1

PER CENT.

New England	50	.....	.....	.....	90.00	6.00	.....	4.00	.....
Eastern	258	.....	7.75	6.59	74.03	11.24	.....	.39	.....
Pittsburgh	606	.....	.83	19.31	63.20	3.63	0.17	12.87	.....
Great Lakes and Middle West	315	0.32	.95	.....	84.13	13.33	.95	.....	0.32
Southern	58	.....	5.17	15.52	.....	79.31	.....	.....	.....
Pacific Coast	1	.....	.....	(1)	.....	.....	.....	.....	.....
Total	1,288	.08	2.41	10.48	69.33	11.02	.31	6.29	.08

[1] Not given on account of the small number involved.

CARPENTERS.

The customary working hours for carpenters in each of the districts were 60 hours per week. Only a small proportion were reported as working more than that number of hours and less than 1 per cent of the total number customarily worked 72 hours or more per week.

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The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—CARPENTERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	62	.....	2	.....	60	.....	.....	.....	.....	.....
Eastern	197	.....	28	26	125	17	1	.....	.....	.....
Pittsburgh	764	.....	40	198	422	100	1	2	.....	1
Great Lakes and Middle West	707	.....	15	13	541	127	2	2	7	.....
Southern	229	4	.....	15	197	11	1	.....	1	.....
Pacific Coast	1	.....	.....	1	.....	.....	.....	.....	.....	.....
Total	1,960	4	85	253	1,345	255	5	4	8	1

PER CENT.

New England	62	.....	3.23	.....	96.77	.....	.....	.....	.....	.....
Eastern	197	.....	14.21	13.20	63.45	8.63	0.51	.....	.....	.....
Pittsburgh	764	.....	5.24	25.92	55.24	13.09	.13	0.26	.....	0.13
Great Lakes and Middle West	707	.....	2.12	1.84	76.52	17.96	.28	.28	0.99	.....
Southern	229	1.75	.....	6.55	86.03	4.80	.44	.....	.44	.....
Pacific Coast	1	.....	.....	(1)	.....	.....	.....	.....	.....	.....
Total	1,960	.20	4.34	12.91	68.62	13.01	.26	.20	.41	.05

[1] Not given on account of the small number involved.

ELECTRICIANS.

The customary working hours for electricians were over 60 hours per week. Practically all of the electricians were employed either in connection with the power-generating stations, where constant attendance is necessary, or in connection with the repair and maintenance of the electrical equipment, a large part of which work can best be done when the mills are not operated. Proper arrangements, however, can easily be made, as the experience of several of the large companies has shown, to greatly reduce the required number of working hours for this class of employees and at least to insure every individual one day of rest in each week. The evils of the long working hours reported for this class of employees are greatly increased by the fact that in case of a breakdown these men are likely to be called upon to remain on duty continuously until the mill is in operation again. This frequently requires continuous work for as much as 36 hours with only slight interruptions for meals. No sleep can be obtained during these long periods of rush work and the men are consequently almost completely exhausted at the end of the period. Considerable variations are shown to exist between the different districts as regards customary working hours for the electricians.

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The working hours were, however, shortest in the New England and Eastern districts, where the proportion of small rolling mills is large and where the necessary repair work can consequently be done on Saturday night, when the mills are shut down.

The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—ELECTRICIANS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—							
		Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	38	.....	.....	28	5	1	2	.....	2
Eastern	120	10	38	37	15	2	9	8	1
Pittsburgh	413	3	12	23	85	78	63	141	8
Great Lakes and Middle West	404	.....	11	127	84	60	19	99	4
Southern	33	.....	.....	.....	6	4	1	21	1
Total	1,008	13	61	215	195	145	94	269	16

PER CENT.

New England	38	.....	.....	73.68	13.16	2.63	5.26	.....	5.26
Eastern	120	8.33	31.67	30.83	12.50	1.67	7.50	6.67	.83
Pittsburgh	413	.73	2.91	5.57	20.58	18.89	15.25	34.14	1.94
Great Lakes and Middle West	404	.....	2.72	31.44	20.79	14.85	4.70	24.50	.99
Southern	33	.....	.....	.....	18.18	12.12	3.03	63.64	3.03
Total	1,008	1.29	6.05	21.33	19.35	14.38	9.33	26.69	1.59

ENGINEERS, YARD LOCOMOTIVE.

The customary working hours for the engineers employed on the yard locomotives were more than 60 hours per week. More than 90 per cent of the engineers in each of the districts were reported as customarily working more than 60 hours per week, and more than 50 per cent in all of the districts, with the exception of the New England district, were reported as working more than 72 hours per week. The customary working hours varied considerably in the different districts, due in a large part to the difference in the proportion of blast furnaces located in the various districts. For example, the proportion of engineers working 84 hours per week appears largest in the Southern district, where the blast furnaces are relatively most numerous.

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The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—ENGINEERS, YARD LOCOMOTIVE.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—							
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.
New England	27	.....	.....	.....	2	14	.....	5	6
Eastern	183	.....	1	1	6	63	9	33	70
Pittsburgh	741	6	1	.....	15	40	206	223	250
Great Lakes and Middle West	300	.....	.....	.....	4	8	132	20	136
Southern	108	.....	.....	.....	.....	26	22	2	58
Total	1,359	6	2	1	27	151	369	283	520

PER CENT.

New England	27	.....	.....	.....	7.41	51.85	.....	18.52	22.22
Eastern	183	.....	0.55	0.55	3.28	34.43	4.92	18.03	38.25
Pittsburgh	741	0.81	.13	.....	2.02	5.40	27.80	30.09	33.74
Great Lakes and Middle West	300	.....	.....	.....	1.33	2.67	44.00	6.67	45.33
Southern	108	.....	.....	.....	.....	24.07	20.37	1.85	53.70
Total	1,359	.44	.15	.07	1.99	11.11	27.15	20.82	38.26

FIREMEN, STATIONARY.

The customary working hours of the stationary firemen in all except the New England district were 84 hours per week, more than one-half of the firemen in each of these districts being employed for the equivalent of 12 hours per day for 7 days per week. More than one-fourth of the firemen, however, were reported as working 72 hours per week or less. These were chiefly employed in connection with the small rolling mills, where it is possible to bank the fires over Sunday or allow them to completely go out without serious economic loss. The proportion of firemen working 72 hours or less was accordingly largest in the New England and Eastern districts, where a relatively large proportion of the plants are small rolling mills or puddling mills.

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The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—FIREMEN, STATIONARY.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—							
		Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	80	.....	2	5	40	1	4	28	.....
Eastern	433	.....	11	17	125	23	33	223	1
Pittsburgh	1,205	3	10	15	108	206	149	713	1
Great Lakes and Middle West.	891	8	.....	21	78	146	70	567	1
Southern	217	.....	.....	10	5	32	.....	170	.....
Pacific Coast	3	.....	.....	.....	.....	.....	.....	3	.....
Total	2,829	11	23	68	356	408	256	1,704	3

PER CENT.

New England	80	.....	2.50	6.25	50.00	1.25	5.00	35.00	.....
Eastern	433	.....	2.54	3.93	28.87	5.31	7.62	51.50	0.23
Pittsburgh	1,205	0.25	.83	1.24	8.96	17.10	12.37	59.17	.08
Great Lakes and Middle West.	891	.90	.....	2.36	8.75	16.39	7.86	63.64	.11
Southern	217	.....	.....	4.61	2.30	14.75	.....	78.34	.....
Pacific Coast	3	.....	.....	.....	.....	.....	.....	(1)	.....
Total	2,829	.39	.81	2.40	12.58	14.42	9.05	60.23	.11

[1] Not given on account of the small number involved.

GASMEN.

The customary working hours for the majority of the gasmen in all except the New England district were 84 hours per week. These men are employed in connection with the gas producers which furnish gas to the open-hearth department and the rolling mills. When the open-hearth furnaces or the rolling mills are not being operated it is possible to take care of the producers with approximately one-half of the regular force. This fact accounts for the large proportion of men in both the Eastern and Pittsburgh districts who were reported as working over 72 and less than 84 hours per week. In those districts several of the open-hearth departments were being operated 6 days and 7 nights per week, and the gasmen accordingly worked approximately the same number of hours that the open-hearth department was operated. Under this system one-half of the regular Sunday day force of gasmen were relieved from duty, which gave each shift an average of one day per month more rest than was secured by the men employed for 84 hours per week. This system also decreased the cost of operation by the amount of daily wages received by the portion of the force which was relieved from duty on Sunday.

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The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—GASMEN.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—							
		Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	43	.....	.....	.....	20	.....	19	4	.....
Eastern	525	2	12	9	47	67	97	289	2
Pittsburgh	692	.....	.....	.....	32	67	201	392	.....
Great Lakes and Middle West	588	.....	.....	8	12	78	53	437	.....
Southern	122	.....	.....	.....	2	8	.....	112	.....
Total	1,970	2	12	17	113	220	370	1,234	2

PER CENT.

New England	43	.....	.....	.....	46.51	.....	44.19	9.30	.....
Eastern	525	0.38	2.29	1.71	8.95	12.76	18.48	55.05	0.38
Pittsburgh	692	.....	.....	.....	4.62	9.68	29.05	56.65	.....
Great Lakes and Middle West	588	.....	.....	1.36	2.04	13.27	9.01	74.32	.....
Southern	122	.....	.....	.....	1.64	6.56	.....	91.80	.....
Total	1,970	.10	.61	.86	5.74	11.17	18.78	62.64	.10

LABORERS.

The customary working hours for the majority of the laborers employed outside of the producing departments were 60 hours or less per week. This class of laborers is chiefly employed to handle materials and products, in keeping the yard clean, and in the very varied tasks which must necessarily be performed to keep the plant and equipment in proper condition. Practically all of this work can be performed during the daytime, and there is no reason for most of these men to work more than 9 or 10 hours per day at the outside. All such work in the yards can be more advantageously done by increasing the working force and completing the work in as short a number of hours as possible while the light is good and the men are comparatively fresh. A number of plants in the Pittsburgh and the Great Lakes and Middle West districts were, however, found to be working even the yard force for 12 hours per day. It is certain that the longer day is preferred by a large number of the laborers, particularly the more recent immigrants, as the earnings for the two hours of additional work add to their weekly income and greatly increase the margin in which savings can be made. This attitude is almost inevitable when the maximum weekly earnings that can be secured for common labor in the Pittsburgh district for 60 hours per

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week are $10.50. This is on the basis of 17½ cents per hour, which is the highest rate paid by any plant in that district for common labor. In the majority of plants in that district the maximum earnings for 60 hours per week are, however, less than $10 per week. The situation will be even more clearly appreciated when it is understood that in the Eastern district, where the customary hourly wages for unskilled labor are 14 cents or less, the maximum weekly earnings, where only 60 hours are worked, are $8.40. A large number of these laborers are unmarried and the pressure of such a low wage on them is by no means so great, but a considerable proportion are married men with families, and weekly earnings of less than $9 per week in the small towns of eastern Pennsylvania and less than $10 in the Pittsburgh districts are far below the amount required by the family unless the wife or some of the children also go to work. The situation is rendered even more difficult for the common laborers by the fact that the size of the force of yard labor is constantly varying in proportion to the necessities of the plant. Furthermore, these workmen are not discharged on the basis of their individual merits, but whole gangs are laid off at once, so that the individual merit of the particular workman and his zeal in performing his duties have little or no bearing on the regularity of his work. The laborers in the yard force, therefore, are unquestionably glad to secure the additional two hours per day which a 12-hour day gives them during the short period in which they have steady employment, as it is absolutely necessary in these periods of employment to put aside some savings which will carry the family over the regularly recurring periods in which no work can be obtained. These facts in a large part account for the ease with which it has been possible for the steel industry to secure a force willing and even anxious to work 12 hours per day. The shorter working hours reported for the Eastern district are due in a large part to the large proportion of small mills in that district in connection with which very little 12-hour work needs to be done.

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The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—LABORERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—							
		Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	341	.....	.....	338	2	.....	.....	.....	1
Eastern	1,874	207	494	943	77	23	111	16	3
Pittsburgh	10,326	420	1,626	3,741	1,939	1,606	378	614	2
Great Lakes and Middle West	5,666	25	356	2,776	1,173	1,174	9	145	8
Southern	1,593	.....	372	1,167	43	4	.....	.....	7
Pacific Coast	48	.....	48	.....	.....	.....	.....	.....	.....
Total	19,848	652	2,896	8,965	3,234	2,807	498	775	21

PER CENT.

New England	341	.....	.....	99.12	0.59	.....	.....	.....	0.29
Eastern	1,874	11.05	26.36	50.32	4.11	1.23	5.92	0.85	.16
Pittsburgh	10,326	4.07	15.75	36.23	18.78	15.55	3.66	5.95	.02
Great Lakes and Middle West	5,666	.44	6.28	48.99	20.70	20.72	.16	2.56	.14
Southern	1,593	.....	23.35	73.26	2.70	.25	.....	.....	.44
Pacific Coast	48	.....	(1)	.....	.....	.....	.....	.....	.....
Total	19,848	3.28	14.59	45.17	16.29	14.14	2.51	3.90	.11

[1] Not given on account of the small number involved.

MACHINISTS.

The customary working hours for the majority of machinists in all districts were 60 hours or less per week. A considerable proportion, however, in all except the New England district were working more than 60 hours per week. This was particularly true of the Pittsburgh, Great Lakes and Middle West, and Southern districts. Practically all of the machinists employed in the shops, it should be remarked, were customarily working 60 hours or less per week. Those who are reported as working more than 60 hours are in large part the machinists employed in making mechanical repairs and attending to the upkeep of the equipment in the various producing departments. Considerable variations between the different districts as regards working hours are shown to exist. This difference arises, however, largely out of the proportion of blast furnaces located in the different districts.

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The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—MACHINISTS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	172	.....	12	.....	146	13	1	.....	.....	.....
Eastern	844	1	141	170	368	114	8	14	23	5
Pittsburgh	2,358	1	179	327	888	368	304	206	44	41
Great Lakes and Middle West	1,717	.....	73	63	839	547	62	67	64	2
Southern	311	.....	.....	41	143	47	75	1	4	.....
Pacific Coast	3	.....	.....	3	.....	.....	.....	.....	.....	.....
Total	5,405	2	405	604	2,384	1,089	450	288	135	48

PER CENT.

New England	172	.....	6.98	.....	84.88	7.56	0.58	.....	.....	.....
Eastern	844	0.12	16.71	20.14	43.60	13.51	.95	1.66	2.73	0.59
Pittsburgh	2,358	.04	7.59	13.87	37.66	15.61	12.89	8.74	1.87	1.74
Great Lakes and Middle West	1,717	.....	4.25	3.67	48.86	31.86	3.61	3.90	3.73	.12
Southern	311	.....	.....	13.18	45.98	15.11	24.12	.32	1.29	.....
Pacific Coast	3	.....	.....	(1)	.....	.....	.....	.....	.....	.....
Total	5,405	.04	7.49	11.17	44.11	20.15	8.33	5.33	2.50	.89

[1] Not given on account of the small number involved.

MACHINISTS' HELPERS.

The customary working hours for machinists' helpers were almost identically the same as for machinists. The slight differences shown to exist in the tables are due chiefly to the difference in the proportion of machinists to machinists' helpers in the various plants. For example, if the proportion of machinists' helpers to machinists in a plant operating its shops 72 hours per week should be twice as large as in a plant where the shops are operated only 60 hours per week, the tabulation will necessarily show relatively longer working hours for the machinists' helpers than for the machinists.

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The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—MACHINISTS' HELPERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	39	.....	3	.....	32	4	.....	.....	.....	.....
Eastern	395	3	22	41	158	130	.....	19	22	.....
Pittsburgh	675	.....	83	100	240	141	37	56	12	6
Great Lakes and Middle West	1,152	.....	10	18	752	242	57	23	44	6
Southern	196	.....	.....	26	104	53	4	1	8	.....
Pacific Coast	2	.....	.....	2	.....	.....	.....	.....	.....	.....
Total	2,459	3	118	187	1,286	570	98	99	86	12

PER CENT.

New England	39	.....	7.69	.....	82.05	10.26	.....	.....	.....	.....
Eastern	395	0.76	5.57	10.38	40.00	32.91	.....	4.81	5.57	.....
Pittsburgh	675	.....	12.30	14.81	35.56	20.89	5.48	8.30	1.78	0.89
Great Lakes and Middle West	1,152	.....	.87	1.56	65.28	21.01	4.95	2.00	3.82	.52
Southern	196	.....	.....	13.27	53.06	27.04	2.04	.51	4.08	.....
Pacific Coast	2	.....	.....	(1)	.....	.....	.....	.....	.....	.....
Total	2,459	.12	4.80	7.60	52.30	23.18	3.99	4.03	3.50	.49

[1] Not given on account of the small number involved.

MILLWRIGHTS.

The customary working hours for the majority of the millwrights were over 60 hours per week. In the Eastern district, however, where a large proportion of small mills are operated which work 6 days and 5 nights per week, the proportion working 60 hours or less per week is very much larger than in any of the other districts. The millwrights are employed in the repair and maintenance of the shafting, gears, and other machinery in the mills, and a large part of their work must necessarily be done when the plant is not operated. The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week:

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NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—MILLWRIGHTS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—							
		Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	10	.....	.....	5	1	.....	3	1	.....
Eastern	86	21	9	15	14	19	1	7	.....
Pittsburgh	703	10	14	155	106	142	92	181	3
Great Lakes and Middle West	234	3	.....	22	41	54	10	103	1
Southern	32	.....	.....	7	1	12	.....	12	.....
Pacific Coast	1	.....	.....	.....	1	.....	.....	.....	.....
Total	1,066	34	23	204	164	227	106	304	4

PER CENT.

New England	10	.....	.....	(1)	(1)	.....	(1)	(1)	.....
Eastern	86	24.42	10.47	17.44	16.28	22.09	1.16	8.14	.....
Pittsburgh	703	1.42	1.99	22.05	15.08	20.20	13.09	25.75	0.43
Great Lakes and Middle West	234	1.28	.....	9.40	17.52	23.08	4.27	44.02	.43
Southern	32	.....	.....	21.88	3.13	37.50	.....	37.50	.....
Pacific Coast	1	.....	.....	.....	(1)	.....	.....	.....	.....
Total	1,066	3.19	2.16	19.14	15.38	21.29	9.94	28.52	.38

[1] Not given on account of the small number involved.

MILLWRIGHTS' HELPERS.

The customary working hours for the millwrights' helpers were more than 60 hours per week in all districts except the Eastern district. In each district the working hours for all millwrights' helpers were almost identically the same as for the millwrights.

The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—MILLWRIGHTS' HELPERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—							
		Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	4	.....	.....	2	2	.....	.....	.....	.....
Eastern	40	20	2	6	.....	5	2	5	.....
Pittsburgh	593	11	17	56	68	104	145	191	1
Great Lakes and Middle West	159	.....	.....	17	10	44	11	75	2
Southern	49	.....	.....	2	18	7	.....	22	.....
Total	845	31	19	83	98	160	158	293	3

PER CENT.

New England	4	.....	.....	(1)	(1)	.....	.....	.....	.....
Eastern	40	50.00	5.00	15.00	.....	12.50	5.00	12.50	.....
Pittsburgh	593	1.85	2.87	9.44	11.47	17.54	24.45	32.21	0.17
Great Lakes and Middle West	159	.....	.....	10.69	6.29	27.67	6.92	47.17	1.26
Southern	49	.....	.....	4.08	36.73	14.29	.....	44.90	.....
Total	845	3.67	2.25	9.82	11.60	18.93	18.70	34.67	.36

[1] Not given on account of the small number involved.

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OILERS AND WIPERS.

The customary working hours for the oilers and wipers in all districts except the New England district were more than 72 hours per week, and in the Pittsburgh, the Great Lakes and Middle West, and the Southern districts the majority of the oilers and wipers were employed 84 hours or over per week. A considerable proportion, however, in each district were employed for 72 hours or less per week. Those working the shorter hours were principally employed in connection with the rolling mills, which are operated only 6 days per week, and where the engine is shut down as soon as the mill ceases to produce. In the blast furnace department and in the engine-rooms of the central power generating station and the water pumping station the engines are kept in operation continuously throughout the week.

The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—OILERS AND WIPERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	25	.....	.....	.....	11	7	2	1	4	.....
Eastern	155	.....	2	1	7	58	12	7	68	.....
Pittsburgh	938	3	2	11	54	86	170	83	522	7
Great Lakes and Middle West	768	.....	.....	4	14	72	173	27	476	2
Southern	105	.....	.....	.....	3	6	18	.....	78	.....
Pacific Coast	1	.....	.....	1	.....	.....	.....	.....	.....	.....
Total	1,992	3	4	17	89	229	375	118	1,148	9

PER CENT.

New England	25	.....	.....	.....	44.00	28.00	8.00	4.00	16.00	.....
Eastern	155	.....	1.29	0.65	4.52	37.42	7.74	4.52	43.87	.....
Pittsburgh	938	0.32	.21	1.17	5.76	9.17	18.12	8.85	55.65	0.75
Great Lakes and Middle West	768	.....	.....	.52	1.82	9.37	22.53	3.52	61.98	.26
Southern	105	.....	.....	.....	2.86	5.71	17.14	.....	74.29	.....
Pacific Coast	1	.....	.....	(1)	.....	.....	.....	.....	.....	.....
Total	1,992	.15	.20	.85	4.47	11.50	18.83	5.92	57.63	.45

[1] Not given on account of the small number involved.

PIPE FITTERS.

The customary working hours for the pipe fitters in each district were less than 72 hours per week. In every district except the Great Lakes and Middle West district the majority of the employees were reported as customarily working 60 hours or less per week. Some of the pipe fitters in each of the principal districts were reported as working 84 hours or over per week.

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The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—PIPE FITTERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—							
		Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	18	1	.....	13	.....	.....	2	.....	2
Eastern	142	13	54	44	17	1	1	9	3
Pittsburgh	500	11	63	238	98	15	26	41	8
Great Lakes and Middle West	325	.....	7	138	96	22	8	50	2
Southern	48	.....	.....	27	14	5	.....	2	.....
Pacific Coast	1	.....	1	.....	.....	.....	.....	.....	.....
Total	1,034	25	125	460	227	43	37	102	15

PER CENT.

New England	18	5.56	.....	72.22	.....	.....	11.11	.....	11.11
Eastern	142	9.15	38.03	30.99	11.97	0.70	.70	6.34	2.11
Pittsburgh	500	2.20	12.60	47.60	19.60	3.00	5.20	8.20	1.60
Great Lakes and Middle West	325	.....	2.15	42.46	30.15	6.77	2.46	15.38	.62
Southern	48	.....	.....	56.25	29.17	10.42	.....	4.17	.....
Pacific Coast	1	.....	(1)	.....	.....	.....	.....	.....	.....
Total	1,034	2.42	12.09	44.49	21.95	4.16	3.58	9.86	1.45

[1] Not given on account of the small number involved.

RIGGERS.

The customary working hours for the majority of the riggers were less than 72 hours per week. Practically all of the work of the riggers must be done in the daytime and, consequently, for a considerable proportion in each of the districts the customary working hours were 60 hours or less per week. In the Pittsburgh and the Great Lakes and Middle West districts, however, a number of the riggers were employed for more than 10 hours per day, and in the Eastern district a large proportion were found to be working more than 72 hours per week and a considerable proportion 84 hours per week.

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The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—RIGGERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—							
		Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	11	.....	.....	11	.....	.....	.....	.....	.....
Eastern	155	16	47	37	7	.....	31	17	.....
Pittsburgh	993	.....	57	299	517	38	53	28	1
Great Lakes and Middle West	658	.....	1	293	218	74	23	47	2
Southern	70	.....	.....	69	.....	1	.....	.....	.....
Total	1,887	16	105	709	742	113	107	92	3

PER CENT.

New England	11	.....	.....	(1)	.....	.....	.....	.....	.....
Eastern	155	10.32	30.32	23.87	4.52	.....	20.00	10.97	.....
Pittsburgh	993	.....	5.74	30.11	52.06	3.83	5.34	2.82	0.10
Great Lakes and Middle West	658	.....	.15	44.53	33.13	11.25	3.50	7.14	.30
Southern	70	.....	.....	98.57	.....	1.43	.....	.....	.....
Total	1,887	.85	5.56	37.57	39.32	5.99	5.67	4.88	.16

[1] Not given on account of the small number involved.

ROLL TURNERS.

The customary working hours for roll turners were 60 hours or less per week. Only a small proportion in any of the districts were found to be working more than 72 hours per week. A considerable proportion, however, in each of the principal districts were found to be working more than 60 hours per week.

The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week:

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NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—ROLL TURNERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—						
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.
New England	15	.....	1	.....	13	1	.....	.....
Eastern	120	.....	34	12	44	30	.....	.....
Pittsburgh	361	.....	15	41	179	90	3	33
Great Lakes and Middle West	196	1	6	4	121	57	4	3
Southern	22	.....	.....	2	8	.....	12	.....
Pacific Coast	1	.....	.....	1	.....	.....	.....	.....
Total	715	1	56	60	365	178	19	36

PER CENT.

New England	15	.....	6.67	.....	86.67	6.67	.....	.....
Eastern	120	.....	28.33	10.00	36.67	25.00	.....	.....
Pittsburgh	361	.....	4.16	11.36	49.58	24.93	0.83	9.14
Great Lakes and Middle West	196	0.51	3.06	2.04	61.73	29.08	2.04	1.53
Southern	22	.....	.....	9.09	36.36	.....	54.55	.....
Pacific Coast	1	.....	.....	(1)	.....	.....	.....	.....
Total	715	.14	7.83	8.39	51.05	24.90	2.66	5.03

[1] Not given on account of the small number involved.

DAYS WORKED PER WEEK.

Under this heading the data relative to the number of days worked per week by employees in nonproductive occupations are discussed in considerable detail. For each of the principal occupations complete data are presented as to the proportion in each district who were working each specified number of days per week. The detailed table (Table III) upon which these summaries for each occupation are based appears in Volume II of this report.

In order to show in a condensed form for all of the occupations the facts relative to the number of days customarily worked, the tables which immediately follow have been prepared. The first of these tables shows for each designated occupation the number and per cent of employees customarily working each specified number of days per week. In this table the data for all districts are combined.

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NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY OCCUPATIONS—ALL DISTRICTS.

NUMBER.

Occupations.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Blacksmiths	1,287	48	14	1,009	11	205
Blacksmiths' helpers	1,662	51	27	1,334	17	233
Boiler makers	786	.....	.....	668	1	117
Boiler makers' helpers	995	.....	.....	843	3	149
Brakemen, conductors, and switchmen	1,831	9	58	[1] 609	274	881
Bricklayers	1,450	1	9	1,197	37	206
Bricklayers' helpers	1,288	2	3	1,126	78	79
Carpenters	1,960	4	3	1,742	.....	211
Electricians	1,008	6	39	490	62	411
Engineers, yard locomotive	1,359	10	31	[2] 512	219	587
Firemen, stationary	2,829	9	154	[3] 637	193	1,836
Gasmen	1,970	26	21	[4] 302	304	1,317
Laborers	19,848	259	867	16,098	358	2,266
Machinists	5,405	221	119	4,159	75	831
Machinists' helpers	2,459	73	51	1,788	30	517
Millwrights	1,066	15	30	[5] 555	76	390
Millwrights' helpers	845	5	4	[2] 322	131	383
Oilers and wipers	1,992	6	105	[4] 561	77	1,243
Pipe fitters	1,034	2	8	718	10	296
Riggers	1,887	1	5	1,360	46	475
Roll turners	715	51	35	602	4	23
All other occupations	27,567	347	1,401	[2] 17,207	644	7,968
Total	81,243	1,146	2,984	[6] 53,839	2,650	20,624

PER CENT.

Blacksmiths	1,287	3.73	1.09	78.40	0.85	15.93
Blacksmiths' helpers	1,662	3.07	1.62	80.26	1.02	14.02
Boiler makers	786	.....	.....	84.99	.13	14.89
Boiler makers' helpers	995	.....	.....	84.72	.30	14.97
Brakemen, conductors, and switchmen	1,831	.49	3.17	[1] 33.26	14.96	48.12
Bricklayers	1,450	.07	.62	82.55	2.55	14.21
Bricklayers' helpers	1,288	.16	.23	87.42	6.06	6.13
Carpenters	1,960	.20	.15	88.88	.....	10.77
Electricians	1,008	.60	3.87	48.61	6.15	40.77
Engineers, yard locomotive	1,359	.74	2.28	[2] 37.67	16.11	43.19
Firemen, stationary	2,829	.32	5.44	[3] 22.52	6.82	64.90
Gasmen	1,970	1.32	1.07	[4] 15.33	15.43	66.85
Laborers	19,848	1.30	4.37	81.11	1.80	11.42
Machinists	5,405	4.09	2.20	76.96	1.39	15.37
Machinists' helpers	2,459	2.97	2.07	72.71	1.22	21.02
Millwrights	1,066	1.41	2.81	[5] 52.06	7.13	36.59
Millwrights' helpers	845	.59	.47	[2] 38.11	15.50	45.33
Oilers and wipers	1,992	.30	5.27	[4] 28.16	3.87	62.40
Pipe fitters	1,034	.19	.77	69.44	.97	28.63
Riggers	1,887	.05	.26	72.07	2.44	25.17
Roll turners	715	7.13	4.90	84.20	.56	3.22
All other occupations	27,567	1.26	5.08	[2] 62.42	2.34	28.90
Total	81,243	1.41	3.67	[6] 66.27	3.26	25.39

[1] Including 14 employees who worked 5 and 7 days alternately.
[2] Including 7 employees who worked 5 and 7 days alternately.
[3] Including 1 employee who worked 5 and 7 days alternately.
[4] Including 4 employees who worked 5 and 7 days alternately.
[5] Including 8 employees who worked 5 and 7 days alternately.
[6] Including 52 employees who worked 5 and 7 days alternately.

In 10 of the 21 occupations shown in the above table more than one-fourth of the employees were reported as customarily working 7 days or turns per per week, and in 7 of the occupations more than 40 per cent customarily worked 7 days or turns per week. More than 60 per cent of the employees customarily worked 7 days or turns per week in the following occupations: Firemen, stationary;

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gasmen, and oilers and wipers. All three of these occupations, it may be noted, were connected with the steam, gas, and water department, and the long hours worked in that department are due to the necessity of keeping up the fires throughout the entire week. In 14 of the 21 occupations, however, more than 50 per cent of the employees customarily worked 6 days or turns per week. With regard to the small proportion of employees in the various occupations reported as working 5 days or turns per week some explanation is necessary. In many cases while the mills are operated 6 days and 5 nights the employees on the day and night shifts do not change shifts. In these cases, of course, the employees on the night shifts are properly reported as working 5 days or turns per week. The employees on the corresponding day turn in these mills are included among those reported as working 6 days per week. Further comment on the facts shown in the above table is unnecessary, as the conditions existing for each of the occupations are discussed in detail in the section which follows.

Before taking up this detailed discussion of the days or turns worked in the separate occupations, however, the following table is presented which shows for each of the districts the number of employees in the principal occupations customarily working each specified number of days or turns per week. This table is presented principally for purposes of easy reference, and no comment on the facts shown is necessary.

NUMBER OF EMPLOYEES IN EACH OCCUPATION CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS.

NEW ENGLAND DISTRICT.

Occupations.	Normal number of employees.	Number of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Blacksmiths	47	4	.....	42	.....	1
Blacksmiths' helpers	56	6	.....	49	.....	1
Boiler makers	2	.....	.....	2	.....	.....
Boiler makers' helpers	.....	.....	.....	.....	.....	.....
Brakemen, conductors, and switchmen	25	.....	.....	21	.....	4
Bricklayers	39	.....	.....	37	.....	2
Bricklayers' helpers	50	.....	.....	47	.....	3
Carpenters	62	.....	.....	62	.....	.....
Electricians	38	.....	3	32	.....	3
Engineers, yard locomotive	27	.....	.....	21	.....	6
Firemen, stationary	80	1	33	13	.....	33
Gasmen	43	.....	3	17	2	21
Laborers	341	3	.....	338	.....	.....
Machinists	172	21	4	138	.....	9
Machinists' helpers	39	2	.....	34	.....	3
Millwrights	10	.....	.....	6	2	2
Millwrights' helpers	4	.....	.....	3	.....	1
Oilers and wipers	25	.....	6	14	.....	5
Pipe fitters	18	.....	.....	14	.....	4
Riggers	11	1	.....	10	.....	.....
Roll turners	15	.....	2	13	.....	.....
All other occupations	483	5	20	401	2	55
Total	1,587	43	71	1,314	6	153

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NUMBER OF EMPLOYEES IN EACH OCCUPATION CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—Continued.

EASTERN DISTRICT.

Occupations.	Normal number of employees.	Number of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Blacksmiths	209	12	7	177	2	11
Blacksmiths' helpers	253	11	5	222	4	11
Boiler makers	67	.....	.....	67	.....	.....
Boiler makers' helpers	63	.....	.....	63	.....	.....
Brakemen, conductors, and switchmen	285	2	45	105	19	114
Bricklayers	267	1	7	172	.....	87
Bricklayers' helpers	258	1	3	233	.....	21
Carpenters	197	4	3	189	.....	1
Electricians	120	3	8	89	5	15
Engineers, yard locomotive	183	4	18	60	16	85
Firemen, stationary	433	2	64	[1] 89	29	249
Gasmen	525	16	10	[2] 96	94	309
Laborers	1,874	53	113	1,536	.....	172
Machinists	844	108	45	632	5	54
Machinists' helpers	395	30	37	211	10	107
Millwrights	86	7	10	60	.....	9
Millwrights' helpers	40	1	.....	32	.....	7
Oilers and wipers	155	.....	38	38	7	72
Pipe fitters	142	1	3	115	.....	23
Riggers	155	.....	5	100	31	19
Roll turners	120	13	4	103	.....	.....
All other occupations	3,585	99	404	2,434	44	604
Total	10,256	368	829	[3] 6,823	266	1,970

PITTSBURGH DISTRICT.

Blacksmiths	609	29	.....	479	9	92
Blacksmiths' helpers	769	32	16	610	13	98
Boiler makers	373	.....	.....	315	1	57
Boiler makers' helpers	390	.....	.....	328	3	59
Brakemen, conductors, and switchmen	1,089	7	9	[4] 337	237	499
Bricklayers	531	.....	2	465	37	27
Bricklayers' helpers	606	1	.....	492	78	35
Carpenters	764	.....	.....	686	.....	78
Electricians	413	.....	20	153	53	187
Engineers, yard locomotive	741	6	9	[5] 267	185	274
Firemen, stationary	1,205	6	34	291	128	746
Gasmen	692	.....	8	91	174	419
Laborers	10,326	148	420	8,001	346	1,411
Machinists	2,358	85	37	1,863	70	303
Machinists' helpers	675	37	.....	497	20	121
Millwrights	703	6	9	[6] 383	72	233
Millwrights' helpers	593	4	4	[5] 215	131	239
Oilers and wipers	938	5	43	[2] 256	64	570
Pipe fitters	500	.....	5	369	10	116
Riggers	993	.....	.....	815	.....	178
Roll turners	361	38	26	271	4	22
All other occupations	14,421	227	562	[5] 9,016	525	4,091
Total	40,050	631	1,204	[7] 26,200	2,160	9,855

GREAT LAKES AND MIDDLE WEST DISTRICT.

Blacksmiths	347	3	7	262	.....	75
Blacksmiths' helpers	471	2	6	379	.....	84
Boiler makers	300	.....	.....	245	.....	55
Boiler makers' helpers	459	.....	.....	380	.....	79
Brakemen, conductors, and switchmen	325	.....	4	124	16	181
Bricklayers	489	.....	.....	404	.....	85
Bricklayers' helpers	315	.....	.....	296	.....	19

[1] Including 1 employee who worked 5 and 7 days alternately.
[2] Including 4 employees who worked 5 and 7 days alternately.
[3] Including 5 employees who worked 5 and 7 days alternately.
[4] Including 14 employees who worked 5 and 7 days alternately.
[5] Including 7 employees who worked 5 and 7 days alternately.
[6] Including 8 employees who worked 5 and 7 days alternately.
[7] Including 47 employees who worked 5 and 7 days alternately.

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NUMBER OF EMPLOYEES IN EACH OCCUPATION CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—Concluded.

GREAT LAKES AND MIDDLE WEST DISTRICT—Concluded.

Occupations.	Normal number of employees.	Number of employees whose customary working time per week was—				
		5 days.	5 and 7 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Carpenters	707	.....	.....	587	.....	120
Electricians	404	3	8	212	4	177
Engineers, yard locomotive	300	.....	4	139	16	141
Firemen, stationary	891	.....	23	202	36	630
Gasmen	588	10	.....	90	34	454
Laborers	5,666	55	311	4,615	12	673
Machinists	1,717	7	9	1,287	.....	414
Machinists' helpers	1,152	4	1	923	.....	224
Millwrights	234	2	11	87	2	132
Millwrights' helpers	159	.....	.....	63	.....	96
Oilers and wipers	768	1	18	227	6	516
Pipe fitters	325	1	.....	187	.....	137
Riggers	658	.....	.....	365	15	278
Roll turners	196	.....	3	192	.....	1
All other occupations	7,581	16	405	4,491	67	2,602
Total	24,052	104	810	15,757	208	7,173

SOUTHERN DISTRICT.

Blacksmiths	74	.....	.....	48	.....	26
Blacksmiths' helpers	112	.....	.....	73	.....	39
Boiler makers	44	.....	.....	39	.....	5
Boiler makers' helpers	83	.....	.....	72	.....	11
Brakemen, conductors, and switchmen	107	.....	.....	22	2	83
Bricklayers	122	.....	.....	118	.....	4
Bricklayers' helpers	58	.....	.....	57	.....	1
Carpenters	229	.....	.....	217	.....	12
Electricians	33	.....	.....	4	.....	29
Engineers, yard locomotive	108	.....	.....	25	2	81
Firemen, stationary	217	.....	.....	42	.....	175
Gasmen	122	.....	.....	8	.....	114
Laborers	1,593	.....	23	1,560	.....	10
Machinists	311	.....	24	236	.....	51
Machinists' helpers	196	.....	13	121	.....	62
Millwrights	32	.....	.....	19	.....	13
Millwrights' helpers	49	.....	.....	9	.....	40
Oilers and wipers	105	.....	.....	25	.....	80
Pipe fitters	48	.....	.....	32	.....	16
Riggers	70	.....	.....	70	.....	.....
Roll turners	22	.....	.....	22	.....	.....
All other occupations	1,463	.....	10	831	6	616
Total	5,198	.....	70	3,650	10	1,468

PACIFIC COAST DISTRICT.

Blacksmiths	1	.....	.....	1	.....	.....
Blacksmiths' helpers	1	.....	.....	1	.....	.....
Boiler makers	.....	.....	.....	.....	.....	.....
Boiler makers' helpers	.....	.....	.....	.....	.....	.....
Brakemen, conductors, and switchmen	.....	.....	.....	.....	.....	.....
Bricklayers	2	.....	.....	1	.....	1
Bricklayers' helpers	1	.....	.....	1	.....	.....
Carpenters	1	.....	.....	1	.....	.....
Electricians	.....	.....	.....	.....	.....	.....
Engineers, yard locomotive	.....	.....	.....	.....	.....	.....
Firemen, stationary	3	.....	.....	.....	.....	3
Gasmen	.....	.....	.....	.....	.....	.....
Laborers	48	.....	.....	48	.....	.....
Machinists	3	.....	.....	3	.....	.....
Machinists' helpers	2	.....	.....	2	.....	.....
Millwrights	1	.....	.....	.....	.....	1
Millwrights' helpers	.....	.....	.....	.....	.....	.....
Oilers and wipers	1	.....	.....	1	.....	.....
Pipe fitters	1	.....	.....	1	.....	.....
Riggers	.....	.....	.....	.....	.....	.....
Roll turners	1	.....	.....	1	.....	.....
All other occupations	34	.....	.....	34	.....	.....
Total	100	.....	.....	95	.....	5

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BLACKSMITHS.

In every district the customary working time for the blacksmiths was 6 days or turns per week. More than three-fourths of the blacksmiths in each district except the Southern district were found to be working 6 days or turns per week. There were considerable variations, however, between the different districts as regards the proportion of blacksmiths reported as working 7 days or turns per week. This arises largely out of the difference in the proportion of blast furnaces to the other departments in the various districts. In the Great Lakes and Middle West district and in the Southern district, where the proportion of blast furnaces is largest, a very considerable proportion of the blacksmiths were reported as working 7 days or turns per week. The blacksmiths reported as working 5 days or turns per week were those employed on the night shift who worked regularly from Monday to Friday on the night shift and were not transferred to the day shift under any conditions. The cases where such transfers from night to day shift are not made are few in number, because the employees nearly always prefer to have the opportunity to work during the daytime for at least a part of the time.

The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—BLACKSMITHS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	47	4	.....	42	.....	1
Eastern	209	12	7	177	2	11
Pittsburgh	609	29	.....	479	9	92
Great Lakes and Middle West	347	3	7	262	.....	75
Southern	74	.....	.....	48	.....	26
Pacific Coast	1	.....	.....	1	.....	.....
Total	1,287	48	14	1,009	11	205

PER CENT.

New England	47	8.51	.....	89.36	.....	2.13
Eastern	209	5.74	3.35	84.69	0.96	5.26
Pittsburgh	609	4.76	.....	78.65	1.48	15.11
Great Lakes and Middle West	347	.86	2.02	75.50	.....	21.61
Southern	74	.....	.....	64.86	.....	35.14
Pacific Coast	1	.....	.....	(1)	.....	.....
Total	1,287	3.73	1.09	78.40	.85	15.93

[1] Not given on account of the small number involved.

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BLACKSMITHS' HELPERS.

The customary working time as regards days or turns per week for the blacksmiths' helpers was almost exactly the same as for the blacksmiths, the slight variation shown being due to the fact that the proportion of blacksmiths' helpers to blacksmiths was not uniform in all establishments.

The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—BLACKSMITHS' HELPERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	56	6	.....	49	.....	1
Eastern	253	11	5	222	4	11
Pittsburgh	769	32	16	610	13	98
Great Lakes and Middle West	471	2	6	379	.....	84
Southern	112	.....	.....	73	.....	39
Pacific Coast	1	.....	.....	1	.....	.....
Total	1,662	51	27	1,334	17	233

PER CENT.

New England	56	10.71	.....	87.50	.....	1.79
Eastern	253	4.35	1.98	87.75	1.58	4.35
Pittsburgh	769	4.16	2.08	79.32	1.69	12.74
Great Lakes and Middle West	471	.42	1.27	80.47	.....	17.83
Southern	112	.....	.....	65.18	.....	34.82
Pacific Coast	1	.....	.....	(1)	.....	.....
Total	1,662	3.07	1.62	80.26	1.02	14.02

[1] Not given on account of the small number involved.

BOILER MAKERS.

The customary working time for boiler makers was 6 days or turns per week, more than 81 per cent of the boiler makers in each district being reported as working 6 days or turns per week. However, a considerable proportion in the Pittsburgh, the Great Lakes and Middle West, and the Southern districts were reported as working 7 days or turns per week.

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The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—BOILER MAKERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	2	.....	.....	2	.....	.....
Eastern	67	.....	.....	67	.....	.....
Pittsburgh	373	.....	.....	315	1	57
Great Lakes and Middle West	300	.....	.....	245	.....	55
Southern	44	.....	.....	39	.....	5
Total	786	.....	.....	668	1	117

PER CENT.

New England	2	.....	.....	100.00	.....	.....
Eastern	67	.....	.....	100.00	.....	.....
Pittsburgh	373	.....	.....	84.45	0.27	15.28
Great Lakes and Middle West	300	.....	.....	81.67	.....	18.33
Southern	44	.....	.....	88.64	.....	11.36
Total	786	.....	.....	84.59	.13	14.89

BOILER MAKERS' HELPERS.

The customary working time for the boiler makers' helpers in each district was 6 days or turns per week. The proportions in each of the principal districts reported as working 6 days or turns per week were almost identical.

The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

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NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—BOILER MAKERS' HELPERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Eastern	63	.....	.....	63	.....	.....
Pittsburgh	390	.....	.....	328	3	59
Great Lakes and Middle West	459	.....	.....	380	.....	79
Southern	83	.....	.....	72	.....	11
Total	995	.....	.....	843	3	149

PER CENT.

Eastern	63	.....	.....	100.00	.....	.....
Pittsburgh	390	.....	.....	84.10	0.77	15.13
Great Lakes and Middle West	459	.....	.....	82.79	.....	17.21
Southern	83	.....	.....	86.75	.....	13.25
Total	995	.....	.....	84.72	.30	14.97

BRAKEMEN, CONDUCTORS, AND SWITCHMEN.

Seven days or turns per week was the customary working time for almost half (48.12 per cent) of the brakemen, conductors, and switchmen. Furthermore, approximately 63 per cent of the employees in this occupation worked on Sunday for at least a part of the time, there being 14.96 per cent who were reported as working 6 and 7 days or turns alternately. There were considerable variations as regards the number of days or turns worked per week in this occupation between the different districts, both as regards the proportion reported as working 7 days or turns and particularly as regards the proportions reported as working 6 and 7 days alternately. These variations arise chiefly from the differences in the geographical distribution of the various branches of the industry. In the Southern district, for example, where the proportion of blast furnaces is very large, more than three-fourths (77.57 per cent) of the employees in this occupation were reported as working 7 days or turns per week. The large proportion in the Pittsburgh district reported as working 6 and 7 days per week alternately arises out of the fact that it is the custom in that district in a large number of plants to operate the open-hearth furnaces on this system of working-days. Those employees reported as working 6 and 7 days alternately may, therefore, be considered as representing the transportation force attached to the open-hearth department in that particular district.

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The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—BRAKEMEN, CONDUCTORS AND SWITCHMEN.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	25	.....	.....	21	.....	4
Eastern	285	2	45	105	19	114
Pittsburgh	1,089	7	9	[1] 337	237	499
Great Lakes and Middle West	325	.....	4	124	16	181
Southern	107	.....	.....	22	2	83
Total	1,831	9	58	[1] 609	274	881

PER CENT.

New England	25	.....	.....	84.00	.....	16.00
Eastern	285	0.70	15.79	36.84	6.67	40.00
Pittsburgh	1,089	.64	.83	[1] 30.95	21.76	45.82
Great Lakes and Middle West	325	.....	1.23	38.15	4.92	55.69
Southern	107	.....	.....	20.56	1.87	77.57
Total	1,831	.49	3.17	[1] 33.26	14.96	48.12

[1] Including 14 employees who worked 5 and 7 days alternately.

BRICKLAYERS.

In each district the customary working time for the majority of bricklayers was 6 days or turns per week. The principal variations from that system of working-days are in the Eastern and the Great Lakes and Middle West districts, where a considerable proportion of the bricklayers were reported as working 7 days or turns per week. A small number in the Pittsburgh district reported as working 6 and 7 days per week alternately were attached to the open-hearth department.

The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

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NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—BRICKLAYERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	39	.....	.....	37	.....	2
Eastern	267	1	7	172	.....	87
Pittsburgh	531	.....	2	465	37	27
Great Lakes and Middle West	489	.....	.....	404	.....	85
Southern	122	.....	.....	118	.....	4
Pacific Coast	2	.....	.....	1	.....	1
Total	1,450	1	9	1,197	37	206

PER CENT.

New England	39	.....	.....	94.87	.....	5.13
Eastern	267	0.37	2.62	64.42	.....	32.58
Pittsburgh	531	.....	.38	87.57	6.97	5.08
Great Lakes and Middle West	489	.....	.....	82.62	.....	17.38
Southern	122	.....	.....	96.72	.....	3.28
Pacific Coast	2	.....	.....	(1)	.....	(1)
Total	1,450	.07	.62	82.55	2.55	14.21

[1] Not given on account of the small number involved.

BRICKLAYERS' HELPERS.

The customary working time for the bricklayers' helpers differed considerably from that reported for the bricklayers. This arises very largely out of the fact that in some of the establishments, as has already been noted, the bricklayers' helpers were not separately reported but were included with the laborers. These variations, however, were not important enough to require extended comment.

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The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—BRICKLAYERS' HELPERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	50	.....	.....	47	.....	3
Eastern	258	1	3	233	.....	21
Pittsburgh	606	1	.....	492	78	35
Great Lakes and Middle West	315	.....	.....	296	.....	19
Southern	58	.....	.....	57	.....	1
Pacific Coast	1	.....	.....	1	.....	.....
Total	1,288	2	3	1,126	78	79

PER CENT.

New England	50	.....	.....	94.00	.....	6.00
Eastern	258	0.39	1.16	90.31	.....	8.14
Pittsburgh	606	.17	.....	81.19	12.87	5.78
Great Lakes and Middle West	315	.....	.....	93.97	.....	6.03
Southern	58	.....	.....	98.28	.....	1.72
Pacific Coast	1	.....	.....	(1)	.....	.....
Total	1,288	.16	.23	87.42	6.06	6.13

[1] Not given on account of the small number involved.

CARPENTERS.

The customary working time for the majority of carpenters in each district was 6 days or turns per week. In all of the districts more than 88 per cent of the carpenters worked 6 days or turns. The comparatively large proportions reported as working 7 days or turns per week in the Pittsburgh and the Great Lakes and Middle West districts arise out of the fact that there was one plant in each of these districts which required the larger part of their carpenters to work on Sunday, the number of carpenters employed being too small to take care of the work in the 6 days.

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The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—CARPENTERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	62	.....	.....	62	.....	.....
Eastern	197	4	3	189	.....	1
Pittsburgh	764	.....	.....	686	.....	78
Great Lakes and Middle West	707	.....	.....	587	.....	120
Southern	229	.....	.....	217	.....	12
Pacific Coast	1	.....	.....	1	.....	.....
Total	1,960	4	3	1,742	.....	211

PER CENT.

New England	62	.....	.....	100.00	.....	.....
Eastern	197	2.03	1.52	95.94	.....	0.51
Pittsburgh	764	.....	.....	89.79	.....	10.21
Great Lakes and Middle West	707	.....	.....	83.03	.....	16.97
Southern	229	.....	.....	94.76	.....	5.24
Pacific Coast	1	.....	.....	(1)	.....	.....
Total	1,960	.20	.15	88.88	.....	10.77

[1] Not given on account of the small number involved.

ELECTRICIANS.

The customary working time for 40.77 per cent of the electricians was 7 days or turns per week. Furthermore, there were 6.15 per cent who were reported as working 7 days every alternate week. There were considerable variations between the different districts as regards the number of days customarily worked per week. In the Southern district, for example, where the proportion of blast furnaces is largest, 87.88 per cent of the electricians were reported as customarily working 7 days or turns per week.

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The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—ELECTRICIANS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	38	.....	3	32	.....	3
Eastern	120	3	8	89	5	15
Pittsburgh	413	.....	20	153	53	187
Great Lakes and Middle West	404	3	8	212	4	177
Southern	33	.....	.....	4	.....	29
Total	1,008	6	39	490	62	411

PER CENT.

New England	38	.....	7.89	84.21	.....	7.89
Eastern	120	2.50	6.67	74.17	4.17	12.50
Pittsburgh	413	.....	4.84	37.05	12.83	45.28
Great Lakes and Middle West	404	.74	1.98	52.48	.99	43.01
Southern	33	.....	.....	12.12	.....	87.88
Total	1,008	.60	3.87	48.61	6.15	40.77

ENGINEERS, YARD LOCOMOTIVE.

Seven days or turns per week was the customary working time for 43.19 per cent of the engineers on yard locomotives. In addition, 16.11 per cent were reported as working 6 and 7 days alternately. The relatively large proportion (24.97 per cent) reported as working 6 and 7 days alternately in the Pittsburgh district were, as has been explained above in connection with the brakemen, conductors, and switchmen, connected with the transportation work for the open-hearth department. While the variations between the different districts as regards the proportion reported as working 7 days or turns per week are largely explained by the difference in the geographical distribution of the various branches of the industry, some comment upon the situation in the Eastern district is necessary. It has been noted in connection with most of the other occupations that the proportion of employees reported as working 7 days or turns per week in the Eastern district was small because the proportion of blast furnaces in that district was also small. In the case of the yard engineers, it may be noted, the per cent of employees reported as working 7 days or turns per week (46.45 per cent) was comparatively large. This apparent contradiction grows out of the fact that most of the plants in the Eastern district are

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comparatively small and do not operate a yard transportation system. This leaves the larger part of the locomotive engineers in the blast-furnace plants and in the large steel plants which also operate blast furnaces. In the blast furnaces and in these larger plants the operating conditions are essentially the same in the Eastern district as in the other districts.

The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—ENGINEERS, YARD LOCOMOTIVE.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately..	6 days.	6 and 7 days alternately.	7 days.
New England	27	.....	.....	21	.....	6
Eastern	183	4	18	60	16	85
Pittsburgh	741	6	9	[1] 267	185	274
Great Lakes and Middle West	300	.....	4	139	16	141
Southern	108	.....	.....	25	2	81
Total	1,359	10	31	[1] 512	219	587

PER CENT.

New England	27	.....	.....	77.78	.....	22.22
Eastern	183	2.19	9.84	32.79	8.74	46.45
Pittsburgh	741	.81	1.21	[1] 36.03	24.97	36.98
Great Lakes and Middle West	300	.....	1.33	46.33	5.33	47.00
Southern	108	.....	.....	23.15	1.85	75.00
Total	1,359	.74	2.28	[1] 37.67	16.11	43.19

[1] Including 7 employees who worked 5 and 7 days alternately.

FIREMEN, STATIONARY.

The customary working time for firemen on stationary engines in all districts except the New England district was 7 days or turns per week. Of the total number of firemen, stationary, 64.90 per cent were reported as working 7 days or turns per week. The relatively large proportion in the New England district reported as working 5 and 6 days alternately are employed in the small rolling mills, where the fires can easily be banked from Saturday afternoon until the mills start again on Monday morning.

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The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—FIREMEN, STATIONARY.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	80	1	33	13	.....	33
Eastern	433	2	64	[1] 89	29	249
Pittsburgh	1,205	6	34	291	128	746
Great Lakes and Middle West	891	.....	23	202	36	630
Southern	217	.....	.....	42	.....	175
Pacific Coast	3	.....	.....	.....	.....	3
Total	2,829	9	154	[1] 637	193	1,836

PER CENT.

New England	80	1.25	41.25	16.25	.....	41.25
Eastern	433	.46	14.78	[1] 20.55	6.70	57.51
Pittsburgh	1,205	.50	2.82	24.15	10.62	61.91
Great Lakes and Middle West	891	.....	2.58	22.67	4.04	70.71
Southern	217	.....	.....	19.35	.....	80.65
Pacific Coast	3	.....	.....	.....	.....	[2]
Total	2,829	.32	5.44	[1] 22.52	6.82	64.90

[1] Including 1 employee who worked 5 and 7 days alternately.
[2] Not given on account of the small number involved.

GASMEN.

The customary working time for the majority of gasmen was 7 days or turns per week, there being 66.85 per cent of the total number reported as working that number of days or turns per week. The successful operation of gas producers practically requires that some proportion of the employees shall be on duty continuously. It is not necessary, however, when the mills are not being operated for the entire number of gasmen on any shift to be on duty. This fact makes it easy to so arrange that on Sunday, if the mills are not being operated, one-half of the regular shift is allowed to be absent from duty. The variations between the different districts as regards the customary working time per week arise chiefly out of the differences in the geographical distribution of the various departments in the industry.

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The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—GASMEN.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	43	.....	3	17	2	21
Eastern	525	16	10	[1] 96	94	309
Pittsburgh	692	.....	8	91	174	419
Great Lakes and Middle West	588	10	.....	90	34	454
Southern	122	.....	.....	8	.....	114
Total	1,970	26	21	[1] 302	304	1,317

PER CENT.

New England	43	.....	6.98	39.53	4.65	48.84
Eastern	525	3.05	1.90	[1] 18.29	17.90	58.86
Pittsburgh	692	.....	1.16	13.15	25.14	60.55
Great Lakes and Middle West	588	1.70	.....	15.31	5.78	77.21
Southern	122	.....	.....	6.56	.....	93.44
Total	1,970	1.32	1.07	[1] 15.33	15.43	66.85

[1] Including 4 employees who worked 5 and 7 days alternately.

LABORERS.

The customary working time for the laborers who are included here under the head of nonproductive occupations was 6 days or turns per week, more than three-fourths of the laborers in each of the districts being reported as working that number of days per week. It should be remembered in considering these figures that the laborers who were reported as working in connection with any particular producing department have been included in the productive occupations for that department. The laborers connected with the blast furnaces, therefore, have been included with that department, and the proportion reported here as working 7 days or turns per week is therefore proportionately small. In spite of the exclusion of the blast furnaces the Pittsburgh and the Great Lakes and Middle West districts both show more than 10 per cent of the laborers as customarily working 7 days or turns per week. This arises largely out of the fact that in a few establishments even the yard force was required to work 7 days per week.

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The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS PER WEEK, BY DISTRICTS—LABORERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	341	3	.....	338	.....	.....
Eastern	1,874	53	113	1,536	.....	172
Pittsburgh	10,326	148	420	8,001	346	1,411
Great Lakes and Middle West	5,666	55	311	4,615	12	673
Southern	1,593	.....	23	1,560	.....	10
Pacific Coast	48	.....	.....	48	.....	.....
Total	19,848	259	867	16,098	358	2,266

PER CENT.

New England	341	0.88	.....	99.12	.....	.....
Eastern	1,874	2.83	6.03	81.96	.....	9.18
Pittsburgh	10,326	1.43	4.07	77.48	3.35	13.66
Great Lakes and Middle West	5,666	.97	5.49	81.45	.21	11.88
Southern	1,593	.....	1.44	97.93	.....	.63
Pacific Coast	48	.....	.....	100.00	.....	.....
Total	19,848	1.30	4.37	81.11	1.80	11.42

MACHINISTS.

The customary working time for the majority of machinists in each of the districts was 6 days or turns per week. There was, however, in each of the districts a considerable proportion reported as working 7 days or turns per week. This latter group is composed principally of the machinists engaged in making mechanical repairs, whose work can best be done when the mills are not operating on Saturday night and Sunday. In the smaller mills which are operated only 6 days and 5 nights this repair work can, of course, be easily taken care of without any necessity for Sunday work. This accounts for the relatively large proportion of machinists in the New England and Eastern districts reported as working less than 6 days or turns per week.

The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

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NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—MACHINISTS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	172	21	4	138	.....	9
Eastern	844	108	45	632	5	54
Pittsburgh	2,358	85	37	1,863	70	303
Great Lakes and Middle West	1,717	7	9	1,287	.....	414
Southern	311	.....	24	236	.....	51
Pacific Coast	3	.....	.....	3	.....	.....
Total	5,405	221	119	4,159	75	831

PER CENT.

New England	172	12.21	2.33	80.23	.....	5.23
Eastern	844	12.80	5.33	74.88	0.59	6.40
Pittsburgh	2,358	3.60	1.57	79.01	2.97	12.85
Great Lakes and Middle West	1,717	.41	.52	74.96	.....	24.11
Southern	311	.....	7.72	75.88	.....	16.40
Pacific Coast	3	.....	.....	(1)	.....	.....
Total	5,405	4.09	2.20	76.95	1.39	15.37

[1] Not given on account of the small number involved.

MACHINISTS' HELPERS.

The customary working time for the majority of the machinists' helpers in each of the districts was 6 days or turns per week. The proportion reported as working 7 days or turns per week is somewhat larger for the machinists' helpers than for the machinists. This arises principally out of the fact that the machinists engaged in making mechanical repairs, of whom a large number worked 7 days or turns per week, ordinarily had a larger proportion of helpers than the machinists who worked in the shops.

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The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—MACHINISTS' HELPERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	79	2	.....	34	.....	3
Eastern	395	30	37	211	10	107
Pittsburgh	675	37	.....	497	20	121
Great Lakes and Middle West	1,152	4	1	923	.....	224
Southern	196	.....	13	121	.....	62
Pacific Coast	2	.....	.....	2	.....	.....
Total	2,459	73	51	1,788	30	517

PER CENT.

New England	39	5.13	.....	87.18	.....	7.69
Eastern	395	7.59	9.37	53.42	2.53	27.09
Pittsburgh	675	5.48	.....	73.63	2.96	17.93
Great Lakes and Middle West	1,152	.35	.09	80.12	.....	19.44
Southern	196	.....	6.63	61.73	.....	31.63
Pacific Coast	2	.....	.....	(1)	.....	.....
Total	2,459	2.97	2.07	72.71	1.22	21.02

[1] Not given on account of the small number involved.

MILLWRIGHTS.

The customary working time for the majority of millwrights in all except the Great Lakes and Middle West district was 6 days or turns per week. There were, however, in each district a considerable number of millwrights reported as working 7 days or turns per week. In the Great Lakes and Middle West district, 56.41 per cent of the millwrights were reported as working 7 days or turns per week.

The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

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NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—MILLWRIGHTS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	10	.....	.....	6	2	2
Eastern	86	7	10	60	.....	9
Pittsburgh	703	6	9	[1] 383	72	233
Great Lake and Middle West	234	2	11	87	2	132
Southern	32	.....	.....	19	.....	13
Pacific Coast	1	.....	.....	.....	.....	1
Total	1,066	15	30	[1] 555	76	390

PER CENT.

New England	10	.....	.....	60.00	20.00	20.00
Eastern	86	8.14	11.63	69.77	.....	10.47
Pittsburgh	703	.85	1.28	[1] 54.48	10.24	33.14
Great Lakes and Middle West	234	.85	4.70	37.18	.85	56.41
Southern	32	.....	.....	59.38	.....	40.63
Pacific Coast	1	.....	.....	.....	.....	[2]
Total	1,066	1.41	2.81	[1] 52.06	7.13	36.59

[1] Including 8 employees who worked 5 and 7 days alternately.
[2] Not given on account of the small number involved.

MILLWRIGHTS' HELPERS.

The customary working time for the millwrights' helpers differed considerably from that reported for the millwrights. This variation is apparent rather than real. In the same establishment the millwrights' helpers are in every case found to be working the same number of days or turns per week as the millwrights. The apparent variation shown in the tables arises out of the fact that in different establishments the proportion of millwrights' helpers to millwrights is very much smaller than in other establishments. For this reason it has happened that in the establishments included in the above table the proportion of millwrights' helpers to millwrights was largest in the establishments in which the millwrights were working 7 days or turns per week. This has tended to make the proportion of millwrights' helpers working 7 days or turns per week relatively larger than is the case for the millwrights.

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The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—MILLWRIGHTS' HELPERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	4	.....	.....	3	.....	1
Eastern	40	1	.....	32	.....	7
Pittsburgh	593	4	4	[1] 215	131	239
Great Lakes and Middle West	159	.....	.....	63	.....	96
Southern	49	.....	.....	9	.....	40
Total	845	5	4	[1] 322	131	383

PER CENT.

New England	4	.....	.....	75.00	.....	25.00
Eastern	40	2.50	.....	80.00	.....	17.50
Pittsburgh	593	.67	0.67	[1] 36.26	22.09	40.30
Great Lakes and Middle West	159	.....	.....	39.62	.....	60.38
Southern	49	.....	.....	18.37	.....	81.63
Total	845	.59	.47	[1] 38.11	15.50	45.33

[1] Including 7 employees who worked 5 and 7 days alternately.

OILERS AND WIPERS.

The customary working time for 62.40 per cent of the oilers and wipers was 7 days or turns per week. A large proportion of the oilers and wipers worked in the engine-rooms operated in connection with the blast furnaces, and for this reason the proportion of oilers and wipers shown as working 7 days or turns per week is largest in those districts where the relative number of blast furnaces is largest, as for example, in the Southern district.

The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

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NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—OILERS AND WIPERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	25	.....	6	14	.....	5
Eastern	155	.....	38	38	7	72
Pittsburgh	938	5	43	[1] 256	64	570
Great Lakes and Middle West	768	1	18	227	6	516
Southern	105	.....	.....	25	.....	80
Pacific Coast	1	.....	.....	1	.....	.....
Total	1,992	6	105	[1] 561	77	1,243

PER CENT.

New England	25	.....	24.00	56.00	.....	20.00
Eastern	155	.....	24.52	24.52	4.52	46.45
Pittsburgh	938	0.53	4.58	[1] 27.29	6.82	60.77
Great Lakes and Middle West	768	.13	2.34	29.56	.78	67.19
Southern	105	.....	.....	23.81	.....	76.19
Pacific Coast	1	.....	.....	[2]	.....	.....
Total	1,992	.30	5.27	[1] 28.16	3.87	62.40

[1] Including 4 employees who worked 5 and 7 days alternately.
[2] Not given on account of the small number involved.

PIPE FITTERS.

The customary working time for the majority of pipe fitters in each district was 6 days or turns per week. A considerable proportion, however, in each district was reported as working 7 days or turns per week. This group reported as working 7 days or turns per week was principally employed in making mechanical repairs, which work can of course be done to greatest advantage when the mills are not being operated.

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The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS PER WEEK, BY DISTRICTS—PIPE FITTERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	18	.....	.....	14	.....	4
Eastern	142	1	3	115	.....	23
Pittsburgh	500	.....	5	369	10	116
Great Lakes and Middle West	325	1	.....	187	.....	137
Southern	48	.....	.....	32	.....	16
Pacific Coast	1	.....	.....	1	.....	.....
Total	1,034	2	8	718	10	296

PER CENT.

New England	18	.....	.....	77.78	.....	22.22
Eastern	142	0.70	2.11	80.99	.....	16.20
Pittsburgh	500	.....	1.00	73.80	2.00	23.20
Great Lakes and Middle West	325	.31	.....	57.54	.....	42.15
Southern	48	.....	.....	66.67	.....	33.33
Pacific Coast	1	.....	.....	(1)	.....	.....
Total	1,034	.19	.77	69.44	.97	28.63

[1] Not given on account of the small number involved.

RIGGERS.

The customary working time for the majority of riggers in each district was 6 days or turns per week. In the Great Lakes and Middle West district, however, a large proportion (42.25 per cent) was reported as customarily working 7 days or turns per week.

The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

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NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—RIGGERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	11	1	.....	10	.....	.....
Eastern	155	.....	5	100	31	19
Pittsburgh	993	.....	.....	815	.....	178
Great Lakes and Middle West	658	.....	.....	365	15	278
Southern	70	.....	.....	70	.....	.....
Total	1,887	1	5	1,360	46	475

PER CENT.

New England	11	9.09	.....	90.91	.....	.....
Eastern	155	.....	3.23	64.52	20.00	12.26
Pittsburgh	993	.....	.....	82.07	.....	17.93
Great Lakes and Middle West	658	.....	.....	55.47	2.28	42.25
Southern	70	.....	.....	100.00	.....	.....
Total	1,887	.05	.26	72.07	2.44	25.17

ROLL TURNERS.

The customary working time for more than three-fourths of the roll turners in each district was 6 days or turns per week. Those in the Eastern and the Pittsburgh districts reported as working 5 days or turns per week were in reality men employed only on the night shift who worked regularly from Monday to Friday night, inclusive. In these cases the roll turners did not change shift under any circumstances, but worked constantly on the night shift without interruption.

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The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—ROLL TURNERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	15	.....	2	13	.....	.....
Eastern	120	13	4	103	.....	.....
Pittsburgh	361	38	26	271	4	22
Great Lakes and Middle West	196	.....	3	192	.....	1
Southern	22	.....	.....	22	.....	.....
Pacific Coast	1	.....	.....	1	.....	.....
Total	715	51	35	602	4	23

PER CENT.

New England	15	.....	13.33	86.67	.....	.....
Eastern	120	10.83	3.33	85.83	.....	.....
Pittsburgh	361	10.53	7.20	75.07	1.11	6.09
Great Lakes and Middle West	196	.....	1.53	97.96	.....	.51
Southern	22	.....	.....	100.00	.....	.....
Pacific Coast	1	.....	.....	(1)	.....	.....
Total	715	7.13	4.90	84.20	.56	3.22

[1] Not given on account of the small number involved.

EARNINGS, HOURS, AND DAYS OF WORK OF EMPLOYEES IN NONPRODUCTIVE OCCUPATIONS.

GENERAL OCCUPATIONS, PRODUCING DEPARTMENTS.

In this section of the report are shown the data relative to the earnings, hours, and days of work per week for those employees who are connected with the producing departments but whose duties are not directly concerned with production. This class includes the very large group of machinists, millwrights, pipe fitters, and others who are employed in making mechanical repairs; employees in the steam and power departments, except engineers, who for various reasons were classed with the productive occupations. It includes also the employees engaged in the generation of electric light and power and in the repair of the electrical equipment in the different departments, as well as the shipping force of those departments which produce semifinished or finished material. Employees in this particular section are, furthermore, only those whose duties are concerned with some special department (blast furnaces or blooming mills, for example), as distinguished from the general power, mechanical, and

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yard force, which works for the plant as a whole and can not be charged to any specific department. The general nature of the work performed by these two classes of employees is very much the same, but they have been shown separately because the employees in general occupations who are specifically connected with a particular producing department partake in large measure of the special conditions as regards hours of labor and number of days worked per week which exist in that particular department. For example, in the blast furnaces it is customary for the mechanical force to be employed seven days per week, whereas, in most plants the general power, mechanical, and yard force for the entire plant is employed only six days per week.

It should be noted that the laborers in the producing departments have been classed with the productive occupations, so far as they were reported on the pay rolls of the company as working for some specific department. As a matter of fact, although the duties of this group of laborers are in large part directly concerned with production, a large proportion of them would much more properly be classed with the general occupations, both on account of the nature of their work and the difference in the general conditions of labor as regards the number of hours and days worked per week. It was not possible to make this separation, however, as only a very few companies found it feasible to report the data in such a way that this separation could be made. Furthermore, the separation would not be of any special importance, as this class of employees is shifted from job to job as occasion requires.

SUMMARY OF EARNINGS, HOURS, AND DAYS OF WORK.

EARNINGS.

Data relative to the earnings of employees in general occupations charged to particular producing departments were reported for 15,499 employees. The fact of greatest significance as regards earnings for this class of employees is the comparatively narrow range of earnings, less than 1 per cent earning more than 40 cents per hour, while 92.47 per cent of the entire number of employees earned less than 30 cents per hour. Although this class includes a number of highly skilled workmen, such as machinists and millwrights, their earnings seldom amount to more than 35 cents per hour, or $3.50 per day on the basis of 10 hours of labor. On the other hand, owing to the inclusion, as explained above, of many laborers with the productive occupations, the proportion of employees earning under 18 cents per hour is somewhat smaller in the general occupations than in the productive occupations. Of the employees in general occupations 44.60 per cent earned under 18 cents per hour, while in the productive occupations 49.45 per cent earned less than this

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amount per hour. The very largest group of employees in general occupations (63.68 per cent of the total number) earned 16 and under 25 cents per hour. This group includes the lower-grade mechanics, together with the various semiskilled and unskilled employees in the mechanical occupations, and a large number of the stationary firemen and gas-producer men, although the earnings in the last two occupations fall below 16 cents per hour in many parts of the country.

Data relative to earnings were reported for 15,499 employees in the general occupations, of whom 26.56 per cent earned 16 and under 18 cents per hour, 20.71 per cent earned 20 and under 25 cents per hour, and 16.41 earned 18 and under 20 cents per hour. The general level of earnings was very much lower in the Eastern and Southern districts than in the other districts of the industry.

The per cent of employees earning each classified amount per hour in the separate districts is shown in summary form in the following table:

PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: ALL DEPARTMENTS.

Districts.	Normal number of employees.	Per cent of employees earning each classified amount per hour.								
		Under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 cents and over.
New England	268	0.37	6.34	35.82	10.45	23.13	13.06	9.33	0.37	1.12
Eastern	2,891	8.02	29.57	23.97	10.65	16.08	7.51	3.29	.69	.21
Pittsburgh	5,095	3.18	4.24	25.20	23.26	22.57	13.80	7.32	.43	.29
Great Lakes and Middle West	5,397	.69	3.02	34.45	17.25	24.48	11.75	7.78	.33	.26
Southern	1,834	35.28	25.46	10.03	5.02	10.96	5.02	6.71	.76	.76
Pacific Coast	14	.....	.....	.....	.....	71.43	.....	21.43	7.14	.....
Total	15,499	6.96	11.08	26.56	16.41	20.71	10.75	6.70	.49	.34

The wide differences in earnings in the different districts is clearly shown in the above table. This is particularly true as regards employees at the lower rates of earnings. For example, in the Southern district 35.28 per cent earned less than 14 cents per hour, while in the Great Lakes and Middle West district only 0.69 per cent, and in the Pittsburgh district only 3.18 per cent, earned less than 14 cents per hour. In the intermediate and higher groups of earnings the differences between the different districts are much less marked, largely for the reason, which has been pointed out in the introductory chapter of this volume, that the wages of the more highly paid workmen in the mechanical trades are much more nearly standardized throughout the country and for the further reason that in the employment of this class of labor the steel industry is brought much more directly into competition with other industries. For example, in the groups earning 30 and under 40 cents per hour the proportion of employees in the Southern district is not widely different from that in the Pitts-

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burgh district or the Great Lakes and Middle West district. The proportion of employees in the Eastern district earning these higher rates of wages is, however, somewhat smaller, due in large part to the fact that in the large manufacturing centers of eastern Pennsylvania and New Jersey this class of labor can be very much more easily obtained than in other parts of the country.

These relative differences between the different districts are much more clearly shown in the summary in the form of cumulative percentages which follows:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: ALL DEPARTMENTS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	268	0.37	6.72	42.54	52.99	76.12	89.18	98.51	98.88
Eastern	2,891	8.02	37.60	61.57	72.22	88.31	95.81	99.10	99.79
Pittsburgh	5,095	3.18	7.42	32.62	55.88	78.45	91.95	99.27	99.71
Great Lakes and Middle West	5,397	.69	3.71	38.15	55.40	79.88	91.63	99.41	99.74
Southern	1,834	35.28	60.74	70.77	75.79	86.75	91.77	98.47	99.24
Pacific Coast	14	.....	.....	.....	.....	71.43	71.43	92.86	100.00
Total	15,499	6.96	18.05	44.60	61.02	81.72	92.47	99.17	99.66

It will be seen that while the relative proportions earning each classified amount under 20 cents per hour in the different districts differ widely, they approximate much more closely in the groups earning more than 25 cents per hour, and in the two higher groups are almost identical. Less than 10 per cent of the employees in any one of the four principal districts earn as much as 30 cents per hour. Comparing the Pittsburgh district with the Great Lakes and Middle West district, it will be seen that very little difference exists between these two most important districts, except in the groups earning under 18 cents per hour. In the remaining groups these two districts show very similar and, in some cases, almost equal proportions earning each classified amount.

Of the 15,499 employees for whom data regarding wages were reported, 61.02 per cent earned under 20 cents per hour, 92.47 per cent earned less than 30 cents per hour, and less than 1 per cent earned 50 cents or more per hour.

HOURS OF LABOR.

The customary working hours per week were reported for 15,499 employees in general occupations. For 60.33 per cent of the entire number of employees the customary working time was 72 hours and over per week, and for 20.29 per cent the customary working time was 60 hours and under per week. It should be remembered, in con-

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sidering the proportion working 60 hours and under per week, that in the general occupations there is not the same necessity for continuous work throughout the 24 hours that exists in the productive occupations, and that in the majority of cases it would be possible by slightly increasing the force to accomplish the work of making the necessary repairs and carrying on a great deal of the other miscellaneous work about the mill in less than 10 hours.

The per cent of employees working each classified number of hours per week in the different districts is shown in the following summary:

PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: ALL DEPARTMENTS.

Districts.	Normal number of employees.	Per cent of employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	268	0.37	4.85	8.96	35.82	20.90	2.61	9.33	17.16	.....
Eastern	2,891	.66	5.19	9.06	16.19	22.14	4.91	9.17	32.69	.....
Pittsburgh	5,095	.24	.96	2.22	16.09	16.98	16.92	12.99	33.60	.....
Great Lakes and Middle West.	5,397	.09	.80	1.30	11.73	17.55	25.38	3.56	39.60	.....
Southern	1,834	.....	.65	3.16	15.54	26.88	14.72	.65	38.39	.....
Pacific Coast	14	.....	85.71	.....	.....	14.29	.....	.....	.....	.....
Total	15,499	.24	1.80	3.40	14.85	19.38	17.10	7.46	35.77	.....

In the four districts which have a large number of employees it will be seen that there are considerable differences in regard to the customary working time. These, it must be understood, however, arise not so much from any custom peculiar to the district as from the geographical distribution of branches of the industry. For example, the hours of employees in the general occupations connected with the blast-furnace department, which is operated 7 days per week, will naturally be much longer than for those employees who are connected with the rolling mills which usually are operated not more than 6 days per week. This fact explains the large percentage in both the New England and Eastern districts working 60 hours or less per week, as the majority of the establishments in these two districts are rolling mills and puddling mills. It is true, however, that in comparing the Pittsburgh district with the Great Lakes and Middle West district, where the general distribution of the different branches of the industry is very much the same, there is tendency in the plants of the Great Lakes and Middle West district to work on a longer schedule of hours per week than in the Pittsburgh district.

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DAYS PER WEEK.

Seven days or turns per week was the customary working time for 7,910, or 51.04 per cent of the 15,499 employees in the general occupations. Six days or turns per week was the customary working time for 38.25 per cent of all employees. The proportion of employees working alternately 5 and 6 turns per week and also the number working alternately 6 and 7 days per week was very small, each of these two groups having approximately only 5 per cent of the total number of employees. Employees reported as working 7 days per week were, for the most part, either connected with the blast-furnace department, where the plant is regularly operated 7 days per week, or with one of the various mechanical occupations, the duties of which consist chiefly in making repairs of the machinery and other equipment, which can best be done when the plant is shut down on Sunday. Although such repair work can be more conveniently done on Sunday, and some of it must necessarily be done on that day, it is nevertheless a fact that in a great many establishments much work was allowed to accumulate until Sunday, which might very well have been done during the week by a more careful planning of operations or by a slight increase in the force of men maintained for such repairs.

The following table shows for each district the percentage of employees working each specified number of days or turns per week:

PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: ALL DEPARTMENTS.

Districts.	Normal number of employees.	Per cent of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	268	0.75	8.58	60.45	1.49	28.73
Eastern	2,891	3.39	10.03	[1] 36.49	7.37	42.72
Pittsburgh	5,095	.33	5.57	[2] 38.23	8.48	47.38
Great Lakes and Middle West	5,397	.02	4.06	39.19	1.22	55.51
Southern	1,834	.....	.11	34.68	.55	64.67
Pacific Coast	14	.....	.....	85.71	.....	14.29
Total	15,499	.76	5.28	[3] 38.25	4.68	51.04

[1] Including 4 employees who worked 5 and 7 days, alternately.
[2] Including 8 employees who worked 5 and 7 days, alternately.
[3] Including 12 employees who worked 5 and 7 days, alternately.

In making a comparison of the different districts as regards the number of days of labor per week, the same fact regarding the geographical distribution of branches of the industry which has been pointed out in connection with the customary working hours of these employees should be borne in mind. For example, the very large proportion, 64.67 per cent, reported as working 7 days per week in the Southern district was in large part due to the preponderance of

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blast furnaces over other branches of the industry in this particular district. With regard to the large proportion shown in all except the New England and the Pacific Coast districts as working 7 days per week, it should be said that a large part of this 7-day work is unnecessary. A decided step looking to the elimination of 7-day work has been taken through the action of the American Iron and Steel Institute, which has proposed a definite plan by which, through the use of relief men, one day of rest in each week is given to every individual employed.

This plan has been put into successful operation in a number of blast furnaces and steel works throughout the United States. There remain, however, a considerable number of plants which have taken no steps to give this plan or any other similar plan a test, and which have done very little except simply to rearrange the work so as to throw as small a part of it as possible on Sunday. The evils of 7-day work for employees of this class are much increased by the fact that they are frequently called upon in cases of breakdown to work many hours overtime in order to get the mill into operation at the earliest possible moment. This overtime work often amounts to more than an additional turn, so that the employees are on duty almost without interruption for 36 hours or more because of overtime work. In by far the larger number of plants in the iron and steel industry the same hourly rate is paid for overtime as for regular time. It is exceptional for any increase in the rate of wages in the form of "time and one-fourth" or "time and one-half" to be paid for overtime work in any occupations in the industry. With no penalty in the form of increased labor cost for overtime work it is not unnatural for the foreman or superintendent to avoid the trouble of so arranging the work under his direction that overtime work will be unnecessary.

EARNINGS, HOURS, AND DAYS OF WORK, BY DEPARTMENTS.

INTRODUCTION.

In this section are presented data as to earnings, hours, and days of work for the employees in the general occupations in each of the producing departments. The data here given are summarized in the first part of this chapter and are also presented in comparison with the same information for employees in the producing occupations in the introductory chapter of this volume.

BLAST FURNACES.

EARNINGS.

Data relative to earnings were reported for 6,632 employees in general occupations in blast furnaces. This department has an unusually large proportion of employees in general occupations,

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because blast furnace plants are usually separate operating units and do not receive the services of the power, mechanical, and yard force, as is the case with most of the other departments. These employees in general occupations embrace a very wide range of occupations both as regards the nature of the work and the skill of the workmen.

Of the 6,632 employees, 22.17 per cent earned 16 and under 18 cents per hour; 19.84 per cent earned 20 and under 25 cents per hour, and 17.64 per cent earned 18 and under 20 cents per hour. Thus 59.65 per cent of the employees earned 16 and under 25 cents per hour. The employees earning the rates of wages falling within these groups are, for the most part, semiskilled mechanics of various kinds, and the specialized unskilled occupations, such as stationary firemen. In the Pittsburgh district 71.29 per cent of the employees earned 16 and under 25 cents per hour. In the table which follows are shown data as to classified earnings per hour for the employees in each of the districts, as well as for the industry as a whole. The first part of the table shows the number of employees earning each classified amount per hour; the second part shows the per cent.

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: BLAST FURNACES.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.										
		Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 and under 60 cents.	60 and under 70 cents.
New England	59	1	.....	11	21	5	15	6	.....	.....	.....	.....
Eastern	961	21	96	279	242	124	129	66	24	.....	.....	.....
Pittsburgh	2,281	16	29	63	526	601	499	311	224	11	1	.....
Great Lakes and Middle West	2,122	7	8	73	576	382	542	319	204	7	2	2
Southern	1,189	200	319	214	105	58	131	53	84	12	12	1
Total	6,632	245	452	640	1,470	1,170	1,316	755	536	30	15	3

PER CENT.

New England	59	1.69	.....	18.64	35.59	8.47	25.42	10.17	.....	.....	.....	.....
Eastern	961	2.14	9.79	28.44	24.67	12.64	13.15	6.73	2.45	.....	.....	.....
Pittsburgh	2,281	.70	1.27	2.76	23.06	26.35	21.88	13.63	9.82	0.48	0.04	.....
Great Lakes and Middle West	2,122	.33	.38	3.44	27.14	18.00	25.54	15.03	9.61	.33	.09	0.09
Southern	1,189	16.82	26.83	18.00	8.83	4.88	11.02	4.46	7.06	1.01	1.01	.08
Total	6,632	3.69	6.82	9.65	22.17	17.64	19.84	11.38	8.08	.45	.23	.05

Less than 1 per cent of the employees in the general occupations earned as much as 50 cents per hour, while 3.69 per cent earned less than 12 cents per hour. Of the employees earning less than 12 cents per hour, however, a large number were boys employed in carrying tests to the laboratory and performing various other errands. This

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does not apply, however, to the Southern district, where 16.82 per cent of all employees in general occupations earned less than 12 cents per hour. In that district a number of establishments were reported as paying less than 12 cents per hour to unskilled helpers and in such occupations as that of the stationary firemen. It should be noted, however, that while in the Southern district the earnings of the least skilled workmen are decidedly lower than in the other districts, the very highly skilled workmen in these general occupations are paid at least as well as in the Pittsburgh and Great Lakes and Middle West districts, where the general level of earnings was decidedly higher. For example, in the Southern district 2.10 per cent of all employees earned 40 cents or more per hour as compared with 0.53 per cent in the Pittsburgh district and 0.52 per cent in the Great Lakes and Middle West district.

A comparison of the different districts relative to earnings is more easily made from the table which immediately follows, which shows in the form of cumulative percentages the proportion of employees earning less than each specified amount per hour:

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: BLAST FURNACES.

Districts.	Normal number of employees.	Per cent of employees earning per hour—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	59	1.69	20.34	55.93	64.41	89.83	100.00	100.00	100.00
Eastern	961	11.93	40.37	65.04	77.68	90.83	97.55	100.00	100.00
Pittsburgh	2,281	1.97	4.73	27.79	54.14	76.02	89.65	99.47	99.96
Great Lakes and Middle West	2,122	.71	4.15	31.29	49.29	74.84	89.87	99.48	99.81
Southern	1,189	43.65	61.65	70.48	75.36	86.38	90.83	97.90	98.91
Total	6,632	10.51	20.16	42.33	59.97	79.81	91.19	99.28	99.73

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working hours per week were reported for 6,632 employees in the general occupations in blast furnaces. This group of employees includes chiefly workmen engaged in mechanical repairs and in the transportation of materials and products. Of the entire number, 46.7 per cent were employed for 84 hours or more per week, this being equivalent to a 12-hour day for 7 days a week. Practically all of the other employees in this department were employed 60 hours and less than 72 hours per week, this group including 44.7 per cent of all employees.

The table which follows shows for each district the number and per cent of all employees working each classified number of hours per week:

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NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: BLAST FURNACES.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	59	.....	2	.....	13	10	.....	1	33	.....
Eastern	981	18	12	67	240	131	13	58	440	2
Pittsburgh	2,281	.....	2	3	546	442	48	160	1,074	6
Great Lakes and Middle West	2,122	4	.....	4	248	700	62	51	1,046	7
Southern	1,189	.....	12	37	204	431	14	2	489	.....
Total	6,632	22	28	111	1,251	1,714	137	272	3,082	15

PER CENT.

New England	59	.....	3.39	.....	22.03	16.95	.....	1.69	55.93	.....
Eastern	981	1.83	1.22	6.83	24.46	13.35	1.33	5.91	44.85	0.20
Pittsburgh	2,281	.....	.09	.13	23.94	19.38	2.10	7.01	47.08	.26
Great Lakes and Middle West	2,122	.19	.....	.19	11.69	32.99	2.92	2.40	49.29	.33
Southern	1,189	.....	1.01	3.11	17.16	36.25	1.18	.17	41.13	.....
Total	6,632	.33	.42	1.67	18.86	25.84	2.07	4.10	46.47	.23

DAYS WORKED PER WEEK.

Seven days or turns per week was the customary working time of 75.3 per cent of the 6,632 employees in the general occupations in blast furnaces. A larger proportion of the employees were working 7 days per week in the Great Lakes and Middle West district than in any of the other districts.

The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: BLAST FURNACES.

Districts.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	59	.....	.....	15	.....	44	.....	.....	25.42	.....	74.58
Eastern	981	10	.....	347	31	593	1.02	.....	35.37	3.16	60.45
Pittsburgh	2,281	.....	.....	610	33	1,638	.....	.....	26.74	1.45	71.81
Great Lakes and Middle West	2,122	.....	.....	318	10	1,794	.....	.....	14.99	.47	84.54
Southern	1,189	.....	.....	264	.....	925	.....	.....	22.20	.....	77.80
Total	6,632	.....	.....	1,554	74	4,994	.15	.....	23.43	1.12	75.30

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BESSEMER CONVERTERS.

EARNINGS.

Data relative to earnings were reported for 691 employees in general occupations in Bessemer converters. These employees, it should be remembered, in this department as well as in the other producing departments which follow, include only those who are directly connected with the department and work in that department alone. In addition to these, the Bessemer department, in common with other producing departments, receives the services of the power, mechanical, and yard force when repairs are necessary and in the handling of its materials and products.

Of the 691 employees in general occupations in the Bessemer converters, 32.85 per cent earn 16 and under 18 cents per hour; 26.63 per cent earn 20 and under 25 cents per hour; and 18.81 per cent earn 18 and under 20 cents per hour. Thus, 78.29 per cent of all employees in the general occupations earned 16 and under 25 cents per hour. Only 11.58 per cent of the employees in general occupations earned 25 cents and over per hour. This group includes only the more highly skilled workmen, such as machinists and millwrights, who are permanently attached to this particular department. There were also only 2.03 per cent earning under 14 cents per hour, and practically all of the employees in this particular group were test boys and other boys performing various errands in connection with the operation of the department.

The data in regard to earnings of employees in each district are shown in the table which follows:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: BESSEMER CONVERTERS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.								
		Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.
Eastern	39	.....	.....	3	25	4	7	.....	.....	.....
Pittsburgh	348	2	10	14	112	88	82	37	3	.....
Great Lakes and Middle West	238	1	.....	8	76	36	86	23	7	1
Southern	66	.....	1	31	14	2	9	8	1	.....
Total	691	3	11	56	227	130	184	68	11	1

PER CENT.

Eastern	39	.....	.....	7.69	64.10	10.26	17.95	.....	.....	.....
Pittsburgh	348	0.57	2.87	4.02	32.18	25.29	23.56	10.63	0.86	.....
Great Lakes and Middle West	238	.42	.....	3.36	31.93	15.13	36.13	9.66	2.94	0.42
Southern	66	.....	1.52	46.97	21.21	3.03	13.64	12.12	1.52	.....
Total	691	.43	1.59	8.10	32.85	18.81	26.63	9.84	1.59	.14

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A comparison of the earnings in the different districts is more easily made from the summary in the form of cumulative percentages which follows. On account of the small number of employees reported, a comparison of earnings in the separate districts is possible only for the Pittsburgh and the Great Lakes and Middle West districts. As regards these two districts, the general level of wages for all classes of employees was slightly higher in the Great Lakes and Middle West district than in the Pittsburgh district. In both of these districts the range of earnings was comparatively low. None of the employees in either district earned more than 50 cents per hour and less than 1 per cent in the Pittsburgh district, and less than 4 per cent in the Great Lakes and Middle West district earned as much as 30 cents per hour.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: BESSEMER CONVERTERS.

PER CENT.

Districts.	Normal number of employees.	Per cent of employees earning per hour—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
Eastern	39	.....	7.69	71.79	82.05	100.00	100.00	100.00	100.00
Pittsburgh	348	3.45	7.47	39.66	64.94	88.51	99.14	100.00	100.00
Great Lakes and Middle West	238	.42	3.78	35.71	50.84	86.97	96.64	99.58	100.00
Southern	66	1.52	48.48	69.70	72.73	86.36	98.48	100.00	100.00
Total	691	2.03	10.13	42.98	61.79	88.42	98.26	99.86	100.00

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working hours per week are reported for 691 employees in the general occupations in Bessemer converters. The customary working time for 48.19 per cent was 72 hours per week, this being the equivalent of a 12-hour day for 6 days per week. Almost one-fourth (24.46 per cent) of the employees, however, were working 84 hours per week. As this class of employees includes largely workmen engaged only in mechanical repairs, it is not difficult under ordinary conditions to make such arrangements as will give each employee one day of rest each week. A large proportion working 84 hours per week may, therefore, be considered unnecessary, and any schedule of working hours for this particular class of employees is accentuated by the fact that it is frequent in the case of breakdowns or other emergencies for these employees to work overtime for a great many hours more than the regular day's work. In many cases the total amount of time on duty amounts to 36 hours or more, almost without interruption. Such demands for overtime are especially frequent in case an attempt is being made to produce an unusually high output.

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The table which follows shows for each district the number and per cent of employees working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: BESSEMER CONVERTERS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Eastern	39	.....	.....	.....	.....	30	.....	.....	9	.....
Pittsburgh	348	3	.....	1	2	10	156	77	99	.....
Great Lakes and Middle West	238	.....	.....	.....	24	5	142	6	59	2
Southern	66	.....	.....	20	.....	9	35	.....	2	.....
Total	691	3	.....	21	26	54	333	83	169	2

PER CENT.

Eastern	39	.....	.....	.....	.....	76.92	.....	.....	23.08	.....
Pittsburgh	348	0.86	.....	0.29	0.57	2.87	44.83	22.13	28.45	.....
Great Lakes and Middle West	238	.....	.....	.....	10.08	2.10	59.66	2.52	24.79	0.84
Southern	66	.....	.....	30.30	.....	13.64	53.03	.....	3.03	.....
Total	691	.43	.....	3.04	3.76	7.81	48.19	12.01	24.46	.29

It will be seen from the above table that there is no considerable variation between the two principal districts, the Pittsburgh and the Great Lakes and Middle West districts, as regards customary working hours per week.

DAYS WORKED PER WEEK.

Of the 691 employees in general occupations in Bessemer converters, 63.39 per cent were reported as working 6 days or turns per week. Practically all of the remaining employees were reported as working 7 days or turns per week.

The table which follows shows for each district the number and per cent customarily working each specified number of days per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS, BESSEMER CONVERTERS.

Districts.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Eastern	39	.....	30	.....	.....	9	.....	76.92	.....	.....	23.08
Pittsburgh	348	.....	.....	206	24	118	.....	.....	59.20	6.90	33.91
Great Lakes and Middle West	238	.....	.....	168	2	68	.....	.....	70.59	.84	28.57
Southern	66	.....	.....	64	.....	2	.....	.....	96.97	.....	3.03
Total	691	.....	30	438	26	197	.....	4.34	63.39	3.76	28.51

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OPEN-HEARTH FURNACES.

EARNINGS.

Data relative to earnings were reported for 2,197 employees in the general occupations in the open-hearth furnaces. This group of employees includes the various repair men, as in the other departments, but there is in the open-hearth department in addition a very large number of gas-producing men, who are for the most part relatively unskilled workmen.

Of the 2,197 employees in general occupations, 23.81 per cent earned 16 and under 18 cents per hour and 23.17 per cent earned 20 and under 25 cents per hour. Of the total number of employees 57.31 per cent earned under 20 cents per hour and 80.47 per cent earned under 25 cents per hour. Less than 2 per cent of all employees earned as much as 40 cents per hour and 1.78 per cent earned under 12 cents per hour. The employees earning under 12 cents per hour were all boys employed in carrying tests and performing various other errands in connection with the operation of the department.

The table which follows shows for each district the number and per cent earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: OPEN-HEARTH FURNACES.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.										
		Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.
New England	39	.....	.....	.....	11	7	11	8	1	1	.....	.....
Eastern	609	.....	16	214	134	73	99	36	23	13	1	.....
Pittsburgh	685	36	8	41	106	115	185	152	35	5	.....	2
Great Lakes and Middle West	678	3	5	9	239	108	185	69	51	6	3	.....
Southern	186	.....	3	78	33	20	29	11	12	.....	.....	.....
Total	2,197	39	32	342	523	323	509	276	122	25	4	2

PER CENT.

New England	39	.....	.....	.....	28.21	17.95	28.21	20.51	2.56	2.56	.....	.....
Eastern	609	.....	2.63	35.14	22.00	11.99	16.26	5.91	3.78	2.13	0.16	.....
Pittsburgh	685	5.26	1.17	5.99	15.47	16.79	27.01	22.19	5.11	.73	.....	0.29
Great Lakes and Middle West	678	.44	.74	1.33	35.25	15.93	27.29	10.18	7.52	.88	.44	.....
Southern	186	.....	1.61	41.94	17.74	10.75	15.59	5.91	6.45	.....	.....	.....
Total	2,197	1.78	1.46	15.57	23.81	14.70	23.17	12.56	5.55	1.14	.18	09

A comparison of the earnings in the different districts can best be made from the summary in the form of cumulative percentages shown on the following page.

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Such a comparison, however, should not be too closely drawn, because slight differences of classification in the Great Lakes and Middle West district very greatly affect the relative situation as regards earnings in that particular district. This difficulty arises out of the fact that in the case of one large company in that district it is the custom to charge a very much larger proportion of the power, mechanical, and yard force to the open-hearth department than is the custom in most other large establishments throughout the country. The employees who are added to the open-hearth department by this difference in classification are to a very large extent relatively unskilled workmen, and this tends to depress the general level of earnings in that particular district. This is clearly shown by the fact that while the Great Lakes and Middle West district shows a larger proportion of employees earning 18 and under 20 cents per hour the two districts show approximately the same proportions earning 30 cents and over per hour.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: OPEN-HEARTH FURNACES.

Districts.	Normal number of employees.	Per cent of employees earning per hour—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	39	.....	.....	28.21	46.15	74.36	94.87	97.44	100.00
Eastern	609	2.63	37.77	59.77	71.76	88.01	93.92	97.70	99.84
Pittsburgh	685	6.42	12.41	27.88	44.67	71.68	93.87	98.98	99.71
Great Lakes and Middle West	678	1.18	2.51	37.76	53.69	80.97	91.15	98.67	99.56
Southern	186	1.61	43.55	61.29	72.04	87.63	93.55	100.00	100.00
Total	2,197	3.23	18.80	42.60	57.31	80.47	93.04	98.59	99.73

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working hours per week were reported for 2,197 employees in general occupations of open-hearth furnaces. These employees were in part workmen engaged in mechanical repairs and in part workmen employed in yard transportation of materials and products. The working hours for this general group of employees were unusual, 80.88 per cent of the entire number being employed for 72 hours or more per week and 40.51 per cent being employed for 84 hours or more per week. As regards the different industrial districts, the Pittsburgh district shows a much smaller proportion working 84 hours than any other of the principal districts. Only 16.50 per cent of the employees in the Pittsburgh district were working 84 hours or more per week, while in each of the three other principal districts the working hours for more than 48 per cent of the employees were 84 or more per week.

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The table which follows shows for each district the number and per cent of employees working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: OPEN-HEARTH FURNACES.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	39	1	.....	2	2	14	6	9	5	.....
Eastern	609	.....	4	65	37	83	16	110	289	5
Pittsburgh	685	.....	1	29	17	47	214	113	.....	.....
Great Lakes and Middle West	678	1	.....	.....	74	23	154	61	364	1
Southern	186	.....	.....	.....	.....	20	43	10	113	.....
Total	2,197	2	5	96	130	187	433	454	884	6

PER CENT.

New England	39	2.56	.....	5.13	5.13	35.90	15.38	23.08	12.82	.....
Eastern	609	.....	0.66	10.67	6.08	13.63	2.63	18.06	47.45	0.82
Pittsburgh	685	.....	.15	4.23	2.48	6.86	31.24	38.54	16.50	.....
Great Lakes and Middle West	678	.15	.....	.....	10.91	3.39	22.71	9.00	53.69	.15
Southern	186	.....	.....	.....	.....	10.75	23.12	5.38	60.75	.....
Total	2,197	.09	.23	4.37	5.92	8.51	19.71	20.66	40.24	.27

DAYS WORKED PER WEEK.

Seven days or turns per week was the customary working time for 46.43 per cent of the employees, and 18.30 per cent of the employees were reported as working 6 turns and 7 turns on alternate weeks. Thus 64.73 per cent of all the employees in general occupations in this department were employed on Sunday at least twice a month. There is a considerable difference between the different districts as regards the customary days worked per week. In the Eastern, Great Lakes and Middle West, and Southern districts more than one-half of the employees were reported as working 7 days per week. In the Pittsburgh district, on the other hand, only 22.92 per cent were reported as working 7 days per week, but 35.77 per cent were reported as working 6 and 7 days alternately, this combination of working days giving employees one day of rest at least twice a month.

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The table which follows shows for each district the number and per cent of employees working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: OPEN-HEARTH FURNACES.

Districts.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately	7 days.
New England	39	.....	.....	26	2	11	.....	.....	66.67	5.13	28.21
Eastern	609	3	39	139	99	329	0.49	6.40	22.82	16.26	54.02
Pittsburgh	685	.....	12	271	245	157	.....	1.75	39.56	35.77	22.92
Great Lakes and Middle West	678	.....	.....	241	46	391	.....	.....	35.55	6.78	57.67
Southern	186	.....	.....	44	10	132	.....	.....	23.66	5.38	70.97
Total	2,197	3	51	721	402	1,020	.14	2.32	32.82	18.30	46.43

PUDDLING MILLS.

EARNINGS.

Data relative to the earnings were reported for 314 employees in the general occupations in the puddling mills. This number, it will be noted, is much smaller in comparison to the number in the productive occupations than in the other departments of the steel works and rolling mills. This arises from the fact that in the puddling mills there is very little complicated machinery and almost all the repairs that are necessary are made by the workmen in the productive occupations. Of the 314 employees, 24.20 per cent earned 20 and under 25 cents per hour and 20.70 per cent earned 16 and under 18 cents per hour, the proportion earning each other classified amount per hour being relatively small.

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The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: PUDDLING MILLS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.											
		Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 and under 60 cents.	60 and under 70 cents.	70 cents and over.
New England	40	.....	.....	.....	19	2	7	9	3	.....	.....	.....	.....
Eastern	179	8	19	46	21	10	44	26	3	1	.....	1	.....
Pittsburgh	71	3	4	4	12	10	16	1	18	1	.....	1	1
Great Lakes and Middle West	24	.....	.....	.....	13	.....	9	.....	1	1	.....	.....	.....
Total	314	11	23	50	65	22	76	36	25	3	.....	2	1

PER CENT.

New England	40	.....	.....	.....	47.50	5.00	17.50	22.50	7.50	.....	.....	.....	.....
Eastern	179	4.47	10.61	25.70	11.73	5.59	24.58	14.53	1.68	0.56	.....	0.56	.....
Pittsburgh	71	4.23	5.63	5.63	16.90	14.08	22.54	1.41	25.35	1.41	.....	1.41	1.41
Great Lakes and Middle West	24	.....	.....	.....	54.17	37.50	.....	4.17	4.17	.....	.....	.....	.....
Total	314	3.50	7.32	15.92	20.70	7.01	24.20	11.46	7.96	.96	.....	.64	.32

The number of employees in each of the districts is so small that a comparison of the separate districts might be misleading. The summary in the form of cumulative percentages which immediately follows is given, however, in order that as complete information should be presented for this department as for each of the other producing departments.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: PUDDLING MILLS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	40	.....	.....	47.50	52.50	70.00	92.50	100.00	100.00
Eastern	179	15.08	40.78	52.51	58.10	82.68	97.21	98.88	99.44
Pittsburgh	71	9.86	15.49	32.39	46.48	69.01	70.42	95.77	97.18
Great Lakes and Middle West	24	.....	.....	54.17	91.67	91.67	95.83	100.00	100.00
Total	314	10.83	26.75	47.45	54.46	78.66	90.13	98.09	99.04

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working time per week were reported for 314 employees in general occupations in puddling mills. The working time in this department was very much shorter than in most

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of the other departments. Only 14.97 per cent of the entire number of employees worked as much as 72 hours per week. This shorter schedule of working hours is made possible by the fact that this department, as a rule, is not operated on Sunday nights and generally is not operated in the afternoon on Saturday. This makes it possible for the repair work to be completed without the necessity for work on Sunday.

The following table shows for each district the number and per cent of employees working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: PUDDLING MILLS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 hours and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	40	.....	.....	4	35	1	.....	.....	.....	.....
Eastern	179	1	16	2	89	37	16	11	7	.....
Pittsburgh	71	6	12	.....	27	17	3	3	3	.....
Great Lakes and Middle West	24	.....	12	.....	2	6	.....	.....	4	.....
Total	314	7	40	6	153	61	19	14	14	.....

PER CENT.

New England	40	.....	.....	10.00	87.50	2.50	.....	.....	.....	.....
Eastern	179	0.56	8.94	1.12	49.72	20.67	8.94	6.15	3.91	.....
Pittsburgh	71	8.45	16.90	.....	38.03	23.94	4.23	4.23	4.23	.....
Great Lakes and Middle West	24	.....	50.00	.....	8.33	25.00	.....	.....	16.67	.....
Total	314	2.23	12.74	1.91	48.73	19.43	6.05	4.46	4.46	.....

DAYS WORKED PER WEEK.

Of the 314 employees in general occupations in puddling mills, only 12.42 per cent of the employees were working 7 days per week and 21.66 per cent were working 5 and 6 turns alternately. The employees working 7 days per week in this department were chiefly stationary firemen, whose duties were not very heavy on the day when the department was not operated.

The following table shows for each district the number and per cent of employees working each specified number of days or turns per week:

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NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: PUDDLING MILLS.

Districts.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	40	.....	.....	39	.....	1	.....	.....	97.50	.....	2.50
Eastern	179	6	24	116	11	22	3.35	13.41	64.80	6.15	12.29
Pittsburgh	71	.....	26	33	.....	12	.....	36.62	46.48	.....	16.90
Great Lakes and Middle West	24	.....	18	2	.....	4	.....	75.00	8.33	.....	16.67
Total	314	6	68	190	11	39	1.91	21.66	60.51	3.50	12.42

CRUCIBLE FURNACES.

EARNINGS.

Data relative to the earnings were reported for only 95 employees in the general occupations in crucible furnaces. The number is so small that any comparisons might be misleading. The detailed data are, however, presented in the two tables which follow in order that information for this department should be complete. The first table shows the number and per cent in each of the separate districts earning each classified amount per hour and the second table, which is a summary of the first in the form of cumulative percentages, shows the per cent earning less than each classified amount per hour.

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: CRUCIBLE FURNACES.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.							
		Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.
New England	25	.....	.....	.....	9	2	9	3	2
Eastern	32	.....	.....	.....	2	1	19	10	.....
Pittsburgh	31	1	1	.....	6	7	6	9	1
Great Lakes and Middle West	7	.....	.....	.....	2	.....	.....	.....	5
Total	95	1	1	.....	19	10	34	22	8

PER CENT.

New England	25	.....	.....	.....	36.00	8.00	36.00	12.00	8.00
Eastern	32	.....	.....	.....	6.25	3.13	59.38	31.25	.....
Pittsburgh	31	3.23	3.23	.....	19.35	22.58	19.35	29.03	3.23
Great Lakes and Middle West	7	.....	.....	.....	28.57	.....	.....	.....	71.43
Total	95	1.05	1.05	.....	20.00	10.53	35.79	23.16	8.42

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PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR BY DISTRICTS—GENERAL OCCUPATIONS: CRUCIBLE FURNACES.

Districts.	Normal number of employees.	Per cent of employees earning per hour—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	25	.....	.....	36.00	44.00	80.00	92.00	100.00	100.00
Eastern	32	.....	.....	6.25	9.38	68.75	100.00	100.00	100.00
Pittsburgh	31	6.45	6.45	25.81	48.39	67.74	96.77	100.00	100.00
Great Lakes and Middle West	7	.....	.....	28.57	28.57	28.57	28.57	100.00	100.00
Total	95	2.11	2.11	22.11	32.63	68.42	91.58	100.00	100.00

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working time were reported for 95 employees in general occupations in crucible furnaces. A large number of these employees in general occupations were gas-producer men and their work requires that some employees be on duty day and night throughout the entire week. These gas-producer men, therefore, make up a large part of the proportion (26.32 per cent) who were reported as working 84 hours per week. The rest of the employees in general occupations were largely repair men, and for this class of employees the working hours are comparatively short, 23.16 per cent of the employees being reported as working less than 56 hours per week.

The table which follows shows for each district the number and per cent of employees working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: CRUCIBLE FURNACES.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—							
		Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	25	.....	.....	10	13	.....	.....	2	.....
Eastern	32	11	1	.....	1	.....	9	10	.....
Pittsburgh	31	11	2	5	1	1	.....	11	.....
Great Lakes and Middle West	7	.....	.....	.....	3	2	.....	2	.....
Total	95	22	3	15	18	3	9	25	.....

PER CENT.

New England	25	.....	.....	40.00	52.00	.....	.....	8.00	.....
Eastern	32	34.38	3.13	.....	3.13	.....	28.13	31.25	.....
Pittsburgh	31	35.48	6.45	16.13	3.23	3.23	.....	35.48	.....
Great Lakes and Middle West	7	.....	.....	.....	42.86	28.58	.....	28.57	.....
Total	95	23.16	3.16	15.79	18.95	3.16	9.47	26.32	.....

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DAYS WORKED PER WEEK.

Of the 95 employees in general occupations in crucible furnaces, 41.05 per cent were reported as working 7 days or turns per week. In this group are included for the most part gas-producer men, whose duties require them to be in attendance 7 days per week.

The following table shows for each district the number and per cent of employees working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: CRUCIBLE FURNACES.

Districts.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	25	.....	.....	10	.....	15	.....	.....	40.00	.....	60.00
Eastern	32	.....	.....	13	8	11	.....	.....	40.63	25.00	34.38
Pittsburgh	31	1	.....	19	.....	11	3.23	.....	61.29	.....	35.48
Great Lakes and Middle West	7	.....	3	2	.....	2	.....	42.86	28.57	.....	28.57
Total	95	1	3	44	8	39	1.05	3.16	46.32	8.42	41.05

BLOOMING MILLS.

EARNINGS.

Data relative to earnings were reported for 1,269 employees in the general occupations in the blooming mills. This group includes not only the various workmen needed for making mechanical repairs but, in addition, the number of men connected with the yard transportation and also a large number of workmen in relatively unskilled occupations, such as stationary firemen and gas-producer men. Of the 1,269 employees in the blooming mills 34.67 per cent earned 16 and under 18 cents per hour, 18.99 per cent earned 20 and under 25 cents per hour, and 18.91 per cent 18 and under 20 cents per hour. None of the employees in the general occupations in this department earned as much as 50 cents per hour and only 0.16 per cent earned as much as 40 cents per hour. The employees earning under 12 cents per hour, of whom there were 1.26 per cent, were all boys employed in performing various errands.

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The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: BLOOMING MILLS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.								
		Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.
New England	26	.....	.....	.....	10	8	7	.....	1	.....
Eastern	213	.....	25	60	60	19	30	3	7	.....
Pittsburgh	382	12	2	15	100	104	90	38	20	1
Great Lakes and Middle West	536	4	.....	5	249	101	100	50	26	1
Southern	112	.....	18	34	21	8	14	3	14	.....
Total	1,269	16	45	123	440	240	241	94	68	2

PER CENT.

New England	26	.....	.....	.....	38.46	30.77	26.92	.....	3.85	.....
Eastern	213	.....	11.74	32.39	28.17	8.92	14.08	1.41	3.29	.....
Pittsburgh	382	3.14	.52	3.93	26.18	27.23	23.56	9.95	5.24	0.26
Great Lakes and Middle West	536	.75	.....	.93	46.46	18.84	18.66	9.33	4.85	.19
Southern	112	.....	16.07	30.36	18.75	7.14	12.50	2.68	12.50	.....
Total	1,269	1.26	3.55	9.69	34.67	18.91	18.99	7.41	5.36	.16

The summary in the form of cumulative percentages which follows shows for each of the separate districts the proportion of employees earning less than each specified amount per hour. Of all employees in the general occupations only 5.52 per cent earned as much as 30 cents per hour, although this group includes a large number of highly skilled machinists, millwrights, and electricians required for the maintenance and repair of the large amount of machinery in this department.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: BLOOMING MILLS.

Districts.	Normal number of employees.	Per cent of employees earning—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	26	.....	.....	38.46	69.23	96.15	96.15	100.00	100.00
Eastern	213	11.74	44.13	72.30	81.22	95.31	96.71	100.00	100.00
Pittsburgh	382	3.67	7.59	33.77	60.99	84.56	94.50	99.74	100.00
Great Lakes and Middle West	536	.75	1.68	48.13	66.98	85.63	94.96	99.81	100.00
Southern	112	16.07	46.43	65.18	72.32	84.82	87.50	100.00	100.00
Total	1,269	4.81	14.50	49.17	68.09	87.08	94.48	99.84	100.00

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CUSTOMARY WORKING HOURS PER WEEK.

Data relative to the customary working time were reported for 1,269 employees in general occupations in blooming mills. A large number of employees in general occupations in blooming mills are stationary firemen and gas-producer men, whose duties require that some employees should be on duty continuously day and night throughout the week. This class of employees constituted a large part of those reported as working 84 hours or more per week, of whom there were 38.46 per cent. Approximately 80 per cent of the entire number of employees, however, including a large number engaged simply in making mechanical repairs, were employed for 72 hours and over per week.

The table which follows shows for each district the number and per cent of employees working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: BLOOMING MILLS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	26	.....	.....	.....	.....	9	.....	13	4	.....
Eastern	213	.....	18	12	7	54	12	13	97	.....
Pittsburgh	382	.....	3	4	28	52	111	62	119	3
Great Lakes and Middle West	536	.....	.....	.....	23	6	282	9	216	.....
Southern	112	.....	.....	.....	2	29	32	.....	49	.....
Total	1,269	.....	21	16	60	150	437	97	485	3

PER CENT.

New England	26	.....	.....	.....	.....	34.62	.....	50.00	15.38	.....
Eastern	213	.....	8.45	5.63	3.29	25.35	5.63	6.10	45.54	.....
Pittsburgh	382	.....	.79	1.05	7.33	13.61	29.06	16.23	31.15	0.79
Great Lakes and Middle West	536	.....	.....	.....	4.29	1.12	52.61	1.68	40.30	.....
Southern	112	.....	.....	.....	1.79	25.89	28.57	.....	43.75	.....
Total	1,269	.....	1.65	1.26	4.73	11.82	34.44	7.64	38.22	.24

DAYS WORKED PER WEEK.

Of the 1,269 employees in general occupations in blooming mills 46.97 per cent worked 7 days or turns per week. There was considerable variation between the different districts as regards the proportion of employees working 7 days per week. For example, the Eastern district shows 62.44 per cent of the employees working 7 days per week as compared with 43.19 per cent in the Pittsburgh district and 41.04 per cent in the Great Lakes and Middle West district. With regard to these variations between the different dis-

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tricts, it should be said that there is no reason why all the districts should not attain the standard set by the district in which the best conditions in this regard prevail.

The table which follows shows for each district the number and per cent of employees working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: BLOOMING MILLS.

Districts.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	26	1	7	14	.....	4	3.85	26.92	53.85	.....	15.38
Eastern	213	15	16	37	12	133	7.04	7.51	17.37	5.63	62.44
Pittsburgh	382	12	2	151	52	165	3.14	.52	39.53	13.61	43.19
Great Lakes and Middle West	536	.....	.....	314	2	220	.....	.....	58.58	.37	41.04
Southern	112	.....	.....	38	.....	74	.....	.....	33.93	.....	66.07
Total	1,269	28	25	554	66	596	2.21	1.97	43.66	5.20	46.97

PLATE MILLS.

EARNINGS.

Data relative to earnings were reported for 748 employees in the general occupations in the plate mills. The general class of employees included in this group is very much the same as has already been described in connection with blooming mills, and the general distribution of earnings is very similar. There is a slight difference, however, owing to the fact that a large number of the plate mills are located in the Eastern district, where the general level of earnings is much lower than in either the Pittsburgh or the Great Lakes and Middle West district. More than one-third of all employees, 34.22 per cent, earned 16 and under 18 cents per hour. Only 0.13 per cent earned as much as 50 cents per hour and only 7.48 per cent earned 30 cents per hour and over.

The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

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NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: PLATE MILLS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each specified amount per hour.									
		Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 and under 60 cents.
Eastern	289	2	12	106	99	12	29	15	13	.....	1
Pittsburgh	297	.....	.....	10	91	39	72	61	24	.....	.....
Great Lakes and Middle West	162	.....	.....	4	66	19	40	15	18	.....	.....
Total	748	2	12	120	256	70	141	91	55	.....	1

PER CENT.

Eastern	289	0.69	4.15	36.68	34.26	4.15	10.03	5.19	4.50	.....	0.35
Pittsburgh	297	.....	.....	3.37	30.64	13.13	24.24	20.54	8.08	.....	.....
Great Lakes and Middle West	162	.....	.....	2.47	40.74	11.73	24.69	9.26	11.11	.....	.....
Total	748	.27	1.60	16.04	34.22	9.36	18.85	12.17	7.35	.....	.13

The summary in the form of cumulative percentages which follows shows for each of the separate districts the proportion of employees earning less than each specified amount per hour. The difference between the general distribution of earnings in the Eastern district and that in the two other districts is strikingly shown in this table. For example, 41.52 per cent of all the employees in the Eastern district earned less than 16 cents per hour, while in both the Great Lakes and Middle West and the Pittsburgh districts less than 4 per cent earned under that amount per hour. The range of earnings of the employees in general occupations in this department was remarkably low, practically all of the employees earning more than 14 and less than 30 cents per hour.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: PLATE MILLS.

Districts.	Normal number of employees.	Per cent of employees earning—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
Eastern	289	4.84	41.52	75.78	79.93	89.97	95.16	99.65	99.65
Pittsburgh	297	.....	3.37	34.01	47.14	71.38	91.92	100.00	100.00
Great Lakes and Middle West	162	.....	2.47	43.21	54.94	79.63	88.89	100.00	100.00
Total	748	1.87	17.91	52.14	61.50	80.35	92.51	99.87	99.87

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CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working time per week were reported for 748 employees in general occupations in plate mills. The customary working hours for 20.19 per cent of the employees in general occupations were 84 hours per week and only 4.14 per cent of these employees worked less than 60 hours per week. The general schedule of working hours for this class of employees was decidedly shorter in the Eastern district than in either the Pittsburgh or the Great Lakes and Middle West district.

The table which follows shows for each district the number and per cent of employees working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: PLATE MILLS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Eastern	289	.....	2	24	47	99	47	34	36	.....
Pittsburgh	297	.....	2	3	11	68	99	36	78	.....
Great Lakes and Middle West	162	.....	.....	.....	33	10	82	.....	37	.....
Total	748	.....	4	27	91	177	228	70	151	.....

PER CENT.

Eastern	289	.....	0.69	8.30	16.26	34.26	16.26	11.76	12.46	.....
Pittsburgh	297	.....	.67	1.01	3.70	22.90	33.33	12.12	26.26	.....
Great Lakes and Middle West	162	.....	.....	.....	20.37	6.17	50.62	.....	22.84	.....
Total	748	.....	.53	3.61	12.17	23.66	30.48	9.36	20.19	.....

DAYS WORKED PER WEEK.

Of the 748 employees in general occupations in plate mills, 21.79 per cent were reported as working 7 days or turns per week. As regards the per cent of employees working 7 days per week, the Eastern district shows a much smaller percentage than either of the other districts.

The table which follows shows for each district the number and per cent of employees working each specified number of days or turns per week:

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NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS, PLATE MILLS.

Districts.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Eastern	289	.....	38	[1] 175	33	43	.....	13.15	[1] 60.55	11.42	14.88
Pittsburgh	297	3	19	[2] 156	36	83	1.01	6.40	[2] 52.53	12.12	27.95
Great Lakes and Middle West	162	.....	.....	125	.....	37	.....	.....	77.16	.....	22.84
Total	748	3	57	[3] 456	69	163	.40	7.62	[3] 60.96	9.22	21.79

[1] Including 1 employee who worked 5 and 7 days alternately.
[2] Including 6 employees who worked 5 and 7 days alternately.
[3] Including 7 employees who worked 5 and 7 days alternately.

STANDARD RAIL MILLS.

EARNINGS.

Data relative to earnings were reported for 942 employees in general occupations in standard rail mills. This group of employees includes largely the workmen engaged in making mechanical repairs in the rail mills, but also includes a number of relatively unskilled workmen in such occupations as stationary firemen and gas-producing men.

Of the 942 employees 31.32 per cent earned 16 and under 18 cents per hour, 25.48 per cent earned 20 and under 25 cents per hour, and 13.80 per cent earned 18 and under 20 cents per hour. Less than 2 per cent of all the employees earned as much as 30 cents per hour. Practically all of the workmen earning under 18 cents per hour were unskilled employees, of whom a part were helpers to the workmen in the various mechanical repair occupations.

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The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: STANDARD RAIL MILLS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.									
		Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 and under 60 cents.
Eastern	151	.....	2	44	39	12	48	6	.....	.....	.....
Pittsburgh	141	2	.....	.....	46	12	31	49	.....	.....	1
Great Lakes and Middle West	528	2	.....	3	208	104	152	49	10	.....	.....
Southern	122	.....	41	59	2	2	9	4	5	.....	.....
Total	942	4	43	106	295	130	240	108	15	.....	1

PER CENT.

Eastern	151	.....	1.32	29.14	25.83	7.95	31.79	3.97	.....	.....	.....
Pittsburgh	141	1.42	.....	.....	32.62	8.51	21.99	34.75	.....	.....	0.71
Great Lakes and Middle West	528	.38	.....	.57	39.39	19.70	28.79	9.28	1.89	.....	.....
Southern	122	.....	33.61	48.36	1.64	1.64	7.38	3.28	4.10	.....	.....
Total	942	.42	4.56	11.25	31.32	13.80	26.48	11.46	1.59	.....	.11

The summary which follows shows for each of the separate districts the proportion of employees earning less than each specified amount per hour. The earnings reported in the Southern district were decidedly lower than in either of the other three districts having standard rail mills. Of the 122 employees in the Southern district, 81.97 per cent earned less than 16 cents per hour. The difference between the Eastern district as compared with the Pittsburgh and Great Lakes and Middle West districts lies chiefly in the difference in the rate paid unskilled employees. In the Eastern district the larger number of such unskilled employees were paid less than 16 cents per hour (see p. 338), while in the Great Lakes and Middle West district and in the Pittsburgh district practically all the unskilled workmen received 16 and less than 18 cents per hour.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: STANDARD RAIL MILLS.

Districts.	Normal number of employees.	Per cent of employees earning—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
Eastern	151	1.32	30.46	56.29	64.24	96.03	100.00	100.00	100.00
Pittsburgh	141	1.42	1.42	34.04	42.55	64.54	99.29	99.29	99.29
Great Lakes and Middle West	528	.38	.95	40.34	60.04	88.83	98.11	100.00	100.00
Southern	122	33.61	81.97	83.61	85.25	92.62	95.90	100.00	100.00
Total	942	4.99	16.24	47.56	61.36	86.84	98.30	99.89	99.89

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CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working time were reported for 942 employees in general occupations in standard rail mills. Approximately 85 per cent of these employees were reported as working 72 hours and over per week and 29.19 per cent were reported as working 84 hours per week.

The following table shows for each district the number and per cent of employees working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: STANDARD RAIL MILLS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Eastern	151	.....	.....	.....	.....	86	18	16	31	.....
Pittsburgh	141	.....	.....	.....	7	1	58	.....	75	.....
Great Lakes and Middle West	528	.....	.....	.....	38	3	318	.....	169	.....
Southern	122	.....	.....	.....	4	.....	118	.....	.....	.....
Total	942	.....	.....	.....	49	90	512	16	275	.....

PER CENT.

Eastern	151	.....	.....	.....	.....	56.95	11.92	10.60	20.53	.....
Pittsburgh	141	.....	.....	.....	4.96	.71	41.13	.....	53.19	.....
Great Lakes and Middle West	528	.....	.....	.....	7.20	.57	60.23	.....	32.01	.....
Southern	122	.....	.....	.....	3.28	.....	96.73	.....	.....	.....
Total	942	.....	.....	.....	5.20	9.55	54.35	1.70	29.19	.....

DAYS WORKED PER WEEK.

Seven days or turns was the customary working time per week for 31.53 per cent of the 942 employees in general occupations in standard rail mills.

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The table which follows shows for each district the number and per cent of employees working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: STANDARD RAIL MILLS.

Districts.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Eastern	151	.....	69	18	15	49	.....	45.70	11.92	9.93	32.45
Pittsburgh	141	.....	.....	65	.....	76	.....	.....	46.10	.....	53.90
Great Lakes and Middle West	528	.....	.....	356	.....	172	.....	.....	67.42	.....	32.58
Southern	122	.....	.....	122	.....	.....	.....	.....	100.00	.....	.....
Total	942	.....	69	561	15	297	.....	7.32	59.55	1.59	31.53

STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

EARNINGS.

Data relative to earnings were reported for 332 employees in the general occupations in structural, light rail, and other shape mills. The larger number of these employees were in the Great Lakes and Middle West district. The number reported for the Eastern district and for the Pittsburgh district is so small that any detailed discussion of the earnings of the employees in general occupations in this department is unnecessary. The larger number of employees in the general occupations in this department were unskilled, as is shown by the fact that 57.23 per cent of the 332 employees earned 16 and under 18 cents per hour, which is approximately the standard rate for unskilled labor in the establishments having structural, light rail, and other shape mills.

The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

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NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour—							
		Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.
Eastern	37	.....	.....	.....	19	7	6	5	.....
Pittsburgh	76	8	.....	8	18	15	15	10	2
Great Lakes and Middle West	219	.....	.....	9	153	5	28	19	5
Total	332	8	.....	17	190	27	49	34	7

PER CENT.

Eastern	37	.....	.....	.....	51.35	18.92	16.22	13.51	.....
Pittsburgh	76	10.53	.....	10.53	23.68	19.74	19.74	13.16	2.63
Great Lakes and Middle West	219	.....	.....	4.11	69.86	2.28	12.79	8.68	2.28
Total	332	2.41	.....	5.12	57.23	8.13	14.76	10.24	2.11

The summary in the form of cumulative percentages which follows shows for each of the separate districts the proportion of employees earning less than each specified amount per hour.

No comparison of the different districts should be made on the basis of this table, as the number of employees concerned is so small. The data are, however, shown in detail in order that the information for this department may be complete.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

Districts.	Normal number of employees.	Per cent of employees earning—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
Eastern	37	.....	.....	51.35	70.27	86.49	100.00	100.00	100.00
Pittsburgh	76	10.53	21.05	44.74	64.47	84.21	97.37	100.00	100.00
Great Lakes and Middle West	219	.....	4.11	73.97	76.26	89.04	97.72	100.00	100.00
Total	332	2.41	7.53	64.76	72.89	87.65	97.89	100.00	100.00

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working time were reported for 332 employees in general occupations in structural, light rail, and other shape mills. The number of employees reported is so small that any discussion for this department of customary working hours is unnecessary.

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The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Eastern	37	.....	3	20	.....	11	.....	.....	3	.....
Pittsburgh	76	3	.....	.....	1	3	65	2	2	.....
Great Lakes and Middle West	219	.....	.....	.....	67	1	54	1	96	.....
Total	332	3	3	20	68	15	119	3	101	.....

PER CENT.

Eastern	37	.....	8.11	54.05	.....	29.73	.....	.....	8.11	.....
Pittsburgh	76	3.95	.....	.....	1.32	3.95	85.53	2.63	2.63	.....
Great Lakes and Middle West	219	.....	.....	.....	30.59	.46	24.66	.46	43.84	.....
Total	332	.90	.90	6.02	20.48	4.52	35.84	.90	30.42	.....

DAYS WORKED PER WEEK.

Of the 332 employees in general occupations in structural, light rail, and other shape mills, 30.72 per cent were reported as working 7 days or turns per week and 27.41 per cent were reported as working 5 and 6 turns alternately.

The table which follows shows for each district the number and per cent of employees working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: STRUCTURAL, LIGHT RAIL, AND OTHER SHAPE MILLS.

Districts.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Eastern	37	.....	30	4	.....	3	.....	81.08	10.81	.....	8.11
Pittsburgh	76	.....	1	71	2	2	.....	1.32	93.42	2.63	2.63
Great Lakes and Middle West	219	.....	60	62	.....	97	.....	27.40	28.31	.....	44.29
Total	332	.....	91	137	2	102	.....	27.41	41.27	.60	30.72

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MISCELLANEOUS MECHANICAL MILLS.

EARNINGS.

Data relative to earnings were reported for 403 employees in general occupations in the miscellaneous mechanical mills. Eighty per cent of these employees earned as much as 16 cents per hour and less than 25 cents. The number concerned, however, is so small that any detailed discussion of earnings is unnecessary.

The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: MISCELLANEOUS MECHANICAL MILLS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.							
		Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.
New England	3	.....	.....	.....	.....	.....	3	.....	.....
Eastern	6	.....	.....	.....	2	.....	1	1	2
Pittsburgh	125	4	4	2	35	42	27	5	6
Great Lakes and Middle West	264	2	.....	13	78	72	58	31	10
Southern	5	.....	.....	.....	5	.....	.....	.....	.....
Total	403	6	4	15	120	114	89	37	18

PER CENT.

New England	3	.....	.....	.....	.....	.....	100.00	.....	.....
Eastern	6	.....	.....	.....	33.33	.....	16.67	16.67	33.33
Pittsburgh	125	3.20	3.20	1.60	28.00	33.60	21.60	4.00	4.80
Great Lakes and Middle West	264	.76	.....	4.92	29.55	27.27	21.97	11.74	3.79
Southern	5	.....	.....	.....	100.00	.....	.....	.....	.....
Total	403	1.49	.99	3.72	29.78	28.29	22.08	9.18	4.47

For convenience of study, the data presented in the above table have been summarized in the form of cumulative percentages showing the proportion in each separate district earning less than each specified amount per hour. On account of the small number of employees involved, no discussion of the data presented in this table, which immediately follows, is necessary, although the data are presented here for purposes of comparison.

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PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: MISCELLANEOUS MECHANICAL MILLS.

Districts.	Normal number of employees.	Per cent of employees earning—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	3	.....	.....	.....	.....	100.00	100.00	100.00	100.00
Eastern	6	.....	.....	33.33	33.33	50.00	66.67	100.00	100.00
Pittsburgh	125	6.40	8.00	36.00	69.60	91.20	95.20	100.00	100.00
Great Lakes and Middle West	264	.76	5.68	35.23	62.50	84.47	98.21	100.00	100.00
Southern	5	.....	.....	100.00	100.00	100.00	100.00	100.00	100.00
Total	403	2.48	6.20	35.98	64.27	86.35	95.53	100.00	100.00

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working time were reported for 403 employees in general occupations in the miscellaneous mechanical mills. Practically all of these employees were reported for the Pittsburgh and the Great Lakes and Middle West districts.

The table which follows shows for each of the principal districts the number and per cent of employees customarily working each classified number of hours per week.

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: MISCELLANEOUS MECHANICAL MILLS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	3	.....	.....	.....	.....	2	1	.....	.....	.....
Eastern	6	.....	.....	.....	6	.....	.....	.....	.....	.....
Pittsburgh	125	.....	2	1	6	18	32	26	40	.....
Great Lakes and Middle West	264	.....	.....	.....	37	39	64	50	71	3
Southern	5	.....	.....	.....	.....	.....	5	.....	.....	.....
Total	403	.....	2	1	49	59	102	76	111	3

PER CENT.

New England	3	.....	.....	.....	.....	66.67	33.33	.....	.....	.....
Eastern	6	.....	.....	.....	100.00	.....	.....	.....	.....	.....
Pittsburgh	125	.....	1.60	0.80	4.80	14.40	25.60	20.80	32.00	.....
Great Lakes and Middle West	264	.....	.....	.....	14.02	14.77	24.24	18.94	26.89	1.14
Southern	5	.....	.....	.....	.....	.....	100.00	.....	.....	.....
Total	403	.....	.50	.25	12.16	14.64	25.31	18.86	27.54	.74

DAYS WORKED PER WEEK.

Seven days or turns per week was the customary working time for 43.18 per cent of the 403 employees in general occupations in miscellaneous mechanical mills.

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The table which follows shows for each district the number and per cent of employees working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: MISCELLANEOUS MECHANICAL MILLS.

Districts.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	3	.....	2	1	.....	.....	.....	66.67	33.33	.....	.....
Eastern	6	.....	.....	6	.....	.....	.....	.....	100.00	.....	.....
Pittsburgh	125	.....	10	46	18	51	.....	8.00	36.80	14.40	40.80
Great Lakes and Middle West	264	.....	29	112	.....	123	.....	10.98	42.42	.....	46.59
Southern	5	.....	.....	5	.....	.....	.....	.....	100.00	.....	.....
Total	403	.....	41	170	18	174	.....	10.17	42.18	4.47	43.18

BAR MILLS.

EARNINGS.

Data relative to earnings were reported for 1,178 employees in general occupations in bar mills. The larger number of these employees fall into two groups; the first group, including those employees who are earning the higher rates of wages, are chiefly workmen employed in various occupations concerned with the repair of the machinery in this department; the second group, which includes practically all the employees earning less than 18 cents per hour, is composed for the most part of workmen in unskilled occupations, such as stationary firemen and oilers, and in addition the unskilled helpers of the workmen in the various mechanical repair occupations. The varied character of the work done by employees in the general occupations of bar mills is shown by the very wide range of earnings reported for these employees.

More than 56 per cent of all the employees, however, earned 14 and under 20 cents per hour. In only three of the districts is the number of employees sufficiently large to admit of comparison. Of these three districts, the Eastern district shows decidedly the largest proportion earning less than 16 cents per hour, 33.87 per cent of all the employees in general occupations in that district earning less than that amount. The general level of earnings in the Pittsburgh district was decidedly lower than in the Great Lakes and Middle West district, 62.89 per cent of the employees in the Pittsburgh district earning under 18 cents per hour, as compared with only 31.75 per cent earning less than that amount in the Great Lakes and Middle West district.

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The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: BAR MILLS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.											
		Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 and under 60 cents.	60 and under 70 cents.	70 cents and over.
New England	68	.....	.....	6	26	2	8	7	18	.....	1	.....	.....
Eastern	310	2	12	91	43	35	53	44	23	4	2	.....	1
Pittsburgh	380	5	5	59	170	78	37	5	16	1	1	3	.....
Great Lakes and Middle West	337	.....	3	3	101	33	84	34	73	2	2	2	.....
Southern	69	37	6	9	3	2	4	3	2	2	1	.....	.....
Pacific Coast	14	.....	.....	.....	.....	.....	10	.....	3	1	.....	.....	.....
Total	1,178	44	26	168	343	150	196	93	135	10	7	5	1

PER CENT.

New England	68	.....	.....	8.82	38.24	2.94	11.76	10.29	26.47	.....	1.47	.....	.....
Eastern	310	0.65	3.87	29.35	13.87	11.29	17.11	14.19	7.42	1.29	.65	.....	0.32
Pittsburgh	380	1.32	1.32	15.53	44.74	20.53	9.74	1.32	4.21	.26	.26	0.79	.....
Great Lakes and Middle West	337	.....	.89	.89	29.97	9.79	24.93	10.09	21.66	.59	.59	.59	.....
Southern	69	53.62	8.70	13.04	4.35	2.90	5.80	4.35	2.90	2.90	1.45	.....	.....
Pacific Coast	14	.....	.....	.....	.....	.....	71.43	.....	21.43	7.14	.....	.....	.....
Total	1,178	3.74	2.21	14.26	29.12	12.73	16.64	7.89	11.46	.85	.59	.42	.08

A comparison of the earnings in the different districts is, however, much more easily made from the summary in the form of cumulative percentages which follows. This table shows for each of the separate districts the proportion of employees earning less than each specified amount per hour.

The fact of perhaps the greatest significance shown in this table is that, while the different districts show very wide variations in the rates paid the less skilled workmen, the more highly skilled workmen, including practically all those earning more than 30 cents per hour, are paid very much the same rate in each of the districts. For example, although the Eastern district shows a very much larger proportion earning under 16 cents per hour than either the Pittsburgh or the Great Lakes and Middle West district, the proportion in all three of these districts earning as much as 50 cents per hour is very nearly the same.

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PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: BAR MILLS.

Districts.	Normal number of employees.	Per cent of employees earning—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	68	.....	8.82	47.06	50.00	61.76	72.06	98.53	98.53
Eastern	310	4.52	33.87	47.74	59.03	76.13	90.32	97.74	99.03
Pittsburgh	380	2.63	18.16	62.89	83.42	93.16	94.47	98.68	98.95
Great Lakes and Middle West	337	.89	1.78	31.75	41.54	66.47	76.56	98.22	98.81
Southern	69	62.32	75.36	79.71	82.61	88.41	92.75	95.65	98.55
Pacific Coast	14	.....	.....	.....	.....	71.43	71.43	92.86	100.00
Total	1,178	5.94	20.20	49.32	62.05	78.69	86.59	98.05	98.90

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working time were reported for 1,178 employees in general occupations in bar mills. The schedule of working hours for this department was comparatively short. This comparatively short schedule of working hours was due in large part to the fact that this department is not operated ordinarily on Saturday night, so that it is possible for repairs to be made without necessity for Sunday work. Furthermore, there are no gas producers connected with this department ordinarily, and the number of men required in the boiler rooms connected with these mills is comparatively small. Approximately 28 per cent of all the employees in this department customarily worked less than 60 hours per week. The general schedule of working hours was considerably longer in the Great Lakes and Middle West district than in either of the other principal districts.

The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week:

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NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: BAR MILLS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	68	.....	11	18	34	3	.....	.....	2	.....
Eastern	310	.....	70	69	37	91	19	8	14	2
Pittsburgh	380	.....	16	42	106	94	54	29	38	1
Great Lakes and Middle West	337	.....	25	66	22	90	89	7	38	.....
Southern	69	.....	.....	1	62	4	.....	.....	2	.....
Pacific Coast	14	.....	12	.....	.....	2	.....	.....	.....	.....
Total	1,178	.....	134	196	261	284	162	44	94	3

PER CENT.

New England	68	.....	16.18	26.47	50.00	4.41	.....	.....	2.94	.....
Eastern	310	.....	22.58	22.26	11.94	29.35	6.13	2.58	4.52	0.65
Pittsburgh	380	.....	4.21	11.05	27.89	24.74	14.21	7.63	10.00	.26
Great Lakes and Middle West	337	.....	7.42	19.58	6.53	26.71	26.41	2.08	11.28	.....
Southern	69	.....	.....	1.45	89.86	5.80	.....	.....	2.90	.....
Pacific Coast	14	.....	85.71	.....	.....	14.29	.....	.....	.....	.....
Total	1,178	.....	11.38	16.64	22.16	24.11	13.75	3.74	7.98	.26

DAYS WORKED PER WEEK.

Of the 1,178 employees in general occupations in bar mills only 13.75 per cent worked 7 days or turns per week, while 17.32 per cent were reported as having a working week of less than 6 days or turns. There was considerable variation between the districts as regards the proportion of employees working 6 days or less per week. In the Eastern district, for example, 16.13 per cent of the employees were reported as working 5 days or turns per week and in the Pittsburgh district 24.74 per cent were reported as working 5 and 6 turns per week alternately.

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The table which follows shows for each district the number and per cent of employees working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: BAR MILLS.

Districts.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	68	1	8	57	.....	2	1.47	11.76	83.82	.....	2.94
Eastern	310	50	32	[1] 187	.....	41	16.13	10.32	[1] 60.32	.....	13.23
Pittsburgh	380	1	94	[2] 215	22	48	.26	24.74	[2] 56.58	5.79	12.63
Great Lakes and Middle West	337	1	15	256	.....	65	.30	4.45	75.96	.....	19.29
Southern	69	.....	2	63	.....	4	.....	2.90	91.30	.....	5.80
Pacific Coast	14	.....	.....	12	.....	2	.....	.....	85.71	.....	14.29
Total	1,178	53	151	[3] 790	22	162	4.50	12.82	[3] 67.06	1.87	13.75

[1] Including 3 employees who worked 5 and 7 days alternately.
[2] Including 2 employees who worked 5 and 7 days alternately.
[3] Including 5 employees who worked 5 and 7 days alternately.

GARRETT ROD MILLS.

EARNINGS.

Data relative to earnings were reported for 541 employees in general occupations in Garrett rod mills. The machinery used in this department is very complicated, this fact being reflected in the relatively large proportion of highly skilled workmen earning more than 40 cents per hour.

Of the 541 employees, 2.59 per cent earned as much as 40 cents per hour. However, a relatively large proportion of unskilled workmen in this department are employed in shipping and in storing in warehouses the product, which must be much more carefully cared for to prevent deterioration than the products of the other departments of the steel works.

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The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: GARRETT ROD MILLS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.											
		Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 and under 60 cents.	60 and under 70 cents.	70 cents and over.
New England	4	.....	.....	.....	.....	.....	.....	2	.....	.....	2	.....	.....
Eastern	35	14	.....	1	7	9	.....	3	.....	1	.....	.....	.....
Pittsburgh	139	2	6	.....	50	41	17	5	10	3	2	1	2
Great Lakes and Middle West	278	2	.....	36	98	69	35	25	10	.....	2	1	.....
Southern	85	.....	22	42	1	.....	5	10	5	.....	.....	.....	.....
Total	541	18	28	79	156	119	57	45	25	4	6	2	2

PER CENT.

New England	4	.....	.....	.....	.....	.....	.....	50.00	.....	.....	50.00	.....	.....
Eastern	35	40.00	.....	2.86	20.00	25.71	.....	8.57	.....	2.86	.....	.....	.....
Pittsburgh	139	1.44	4.32	.....	35.97	29.50	12.23	3.60	7.19	2.16	1.44	0.72	1.44
Great Lakes and Middle West	278	.72	.....	12.95	35.25	24.82	12.59	8.99	3.60	.....	.72	.36	.....
Southern	85	.....	25.88	49.41	1.18	.....	5.88	11.76	5.88	.....	.....	.....	.....
Total	541	3.33	5.18	14.60	28.84	22.00	10.54	8.32	4.62	.74	1.11	.37	.37

In the two principal districts for which alone comparison is profitable, the general level and distribution of earnings were practically the same. This fact is more clearly shown in the summary in the form of cumulative percentages which follows.

It will be seen from this table that the general distribution of earnings in the Pittsburgh and the Great Lakes and Middle West districts are practically the same, being only slight variations in any of the classified groups of earnings.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR BY DISTRICTS—GENERAL OCCUPATIONS: GARRETT ROD MILLS.

Districts.	Normal number of employees.	Per cent of employees earning—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	4	.....	.....	.....	.....	.....	50.00	50.00	50.00
Eastern	35	40.00	42.86	62.86	88.57	88.57	97.14	97.14	100.00
Pittsburgh	139	5.76	5.76	41.73	71.22	83.45	87.05	94.24	96.40
Great Lakes and Middle West	278	.72	13.67	48.92	73.74	86.33	95.32	98.92	98.92
Southern	85	25.88	75.29	76.47	76.47	82.35	94.12	100.00	100.00
Total	541	8.50	23.11	51.94	73.94	84.47	92.79	97.41	98.15

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CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working time were reported for 541 employees in general occupations in Garrett rod mills. Less than 7 per cent of the employees in this department customarily worked less than 60 hours per week, although there is no reason why this department should not be operated on the same schedule of working hours as bar mills. The Garrett rod mills, however, are nearly all connected with the larger plants and companies, where the 12-hour working day is much more generally the custom than in the smaller rolling-mill plants.

The table which follows shows for each district the number and per cent of employees customarily working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: GARRETT ROD MILLS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	4	.....	.....	.....	.....	4	.....	.....	.....	.....
Eastern	35	.....	14	2	1	17	1	.....	.....	.....
Pittsburgh	139	.....	.....	14	23	91	8	3	.....	.....
Great Lakes and Middle West	278	.....	6	.....	63	59	121	7	22	.....
Southern	85	.....	.....	.....	13	.....	23	.....	49	.....
Total	541	.....	20	16	100	171	153	10	71	.....

PER CENT.

New England	4	.....	.....	.....	.....	100.00	.....	.....	.....	.....
Eastern	35	.....	40.00	5.71	2.86	48.57	2.86	.....	.....	.....
Pittsburgh	139	.....	.....	10.07	16.55	65.47	5.76	2.16	.....	.....
Great Lakes and Middle West	278	.....	2.16	.....	22.66	21.22	43.53	2.52	7.91	.....
Southern	85	.....	.....	.....	15.29	.....	27.06	.....	57.65	.....
Total	541	.....	3.70	2.96	18.48	31.61	28.28	1.85	13.12	.....

DAYS WORKED PER WEEK.

Of the 541 employees in general occupations in Garrett rod mills, 34.75 per cent were reported as working 5 and 6 days or turns per week alternately, while 13.86 per cent were reported as working 7 days or turns per week.

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The table which follows shows for each district the number and per cent of employees working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: GARRETT ROD MILLS.

Districts.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	4	.....	4	.....	.....	.....	.....	100.00	.....	.....	.....
Eastern	35	14	12	9	.....	.....	40.00	34.29	25.71	.....	.....
Pittsburgh	139	.....	82	54	.....	3	.....	58.99	38.85	.....	2.16
Great Lakes and Middle West	278	.....	90	159	6	23	.....	32.37	57.19	2.16	8.27
Southern	85	.....	.....	36	.....	49	.....	.....	42.35	.....	57.65
Total	541	14	188	258	6	75	2.59	34.75	47.69	1.11	13.86

TUBE MILLS.

EARNINGS.

Data relative to earnings were reported for 157 employees in general occupations in tube mills. The number of employees in this department is so small that detailed discussion is unnecessary, although the data are shown in detail in the two tables which follow in order that the information for this department may be complete.

The first table shows the number and per cent in each district earning each classified amount per hour, and the second table is a summary, based on the first, showing in the form of cumulative percentages the proportion of employees earning less than each cassified amount per hour:

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NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: TUBE MILLS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.								
		Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cts.
New England	4	.....	.....	.....	.....	2	2	.....	.....	.....
Eastern	10	.....	3	2	.....	2	.....	2	.....	1
Pittsburgh	139	2	.....	.....	12	33	73	5	14	.....
Great Lakes and Middle West	4	.....	.....	.....	.....	2	2	.....	.....	.....
Total	157	2	3	2	12	39	77	7	14	1

PER CENT.

New England	4	.....	.....	.....	.....	50.00	50.00	.....	.....	.....
Eastern	10	.....	30.00	20.00	.....	20.00	.....	20.00	.....	10.00
Pittsburgh	139	1.44	.....	.....	8.63	23.74	52.52	3.60	10.07	.....
Great Lakes and Middle West	4	.....	.....	.....	.....	50.00	50.00	.....	.....	.....
Total	157	1.27	1.91	1.27	7.64	24.84	49.04	4.46	8.92	.64

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—GENERAL OCCUPATIONS: TUBE MILLS.

Districts.	Normal number of employees.	Per cent of employees earning—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 60 cents.
New England	4	.....	.....	.....	50.00	100.00	100.00	100.00	100.00
Eastern	10	30.00	50.00	50.00	70.00	70.00	90.00	90.00	100.00
Pittsburgh	139	1.44	1.44	10.07	33.81	86.33	89.93	100.00	100.00
Great Lakes and Middle West	4	.....	.....	.....	50.00	100.00	100.00	100.00	100.00
Total	157	3.18	4.46	12.10	36.94	85.99	90.45	99.36	100.00

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to customary working time were reported for 157 employees in general occupations in tube mills.

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The table which follows shows for each district the number and per cent of employees working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: TUBE MILLS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	4	.....	.....	.....	2	.....	.....	2	.....	.....
Eastern	10	.....	.....	.....	4	.....	.....	6	.....	.....
Pittsburgh	139	.....	.....	14	41	21	13	.....	50	.....
Great Lakes and Middle West	4	.....	.....	.....	2	2	.....	.....	.....	.....
Total	157	.....	.....	14	49	23	13	8	50	.....

PER CENT.

New England	4	.....	.....	.....	50.00	.....	.....	50.00	.....	.....
Eastern	10	.....	.....	.....	40.00	.....	.....	60.00	.....	.....
Pittsburgh	139	.....	.....	10.07	29.50	15.11	9.35	.....	35.97	.....
Great Lakes and Middle West	4	.....	.....	.....	50.00	50.00	.....	.....	.....	.....
Total	157	.....	.....	8.92	31.21	14.65	8.28	5.10	31.85	.....

DAYS WORKED PER WEEK.

Of the 157 employees in general occupations in tube mills 33.12 per cent were reported as working 7 days or turns per week.

The table which follows shows for each district the number and per cent of employees working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—GENERAL OCCUPATIONS: TUBE MILLS.

Districts.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	4	.....	2	.....	2	.....	.....	50.00	.....	50.00	.....
Eastern	10	.....	.....	4	4	2	.....	.....	40.00	40.00	20.00
Pittsburgh	139	.....	38	51	.....	50	.....	27.34	36.69	.....	35.97
Great Lakes and Middle West	4	.....	4	.....	.....	.....	.....	100.00	.....	.....	.....
Total	157	.....	44	55	6	52	.....	28.03	35.03	3.82	33.12

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POWER, MECHANICAL, AND YARD FORCE.

Under the general title "Power, mechanical, and yard force" are included the employees not directly engaged in production, with the exception of those employees who have been classified under the head of "General occupations, producing departments," whose duties are specifically connected with the operation of some particular department. The employees in the power, mechanical, and yard force, on the other hand, do not work for any special departments but are rather a group that can be considered as belonging to the plant only as a whole. The employees in the power, mechanical, and yard force are classified broadly into seven general groups or departments.

1. The steam, gas, and water department, which includes the employees in the various boiler houses, engine-rooms, gas-producer plants, and water-pumping stations.

2. The yard and transportation department, which includes employees on the broad and narrow gauge railways which carry materials and products from department to department and also the very large group of common, unskilled laborers ordinarily known as yard laborers, whose duties vary widely and who are shifted from department to department as the occasion may arise.

3. The electric power and repairs department, which includes both the employees in the generator stations and the large number of electricians, motor inspectors, and similar employees who are required for the upkeep of the electrical equipment of the large plants.

4. The shops department, which includes the large number of employees working in the shops proper. The most important shops operated in connection with the steel plant are as follows: The machine shop, roll shop, boiler shop, blacksmith shop, pipe shop, carpenter, paint, and tin shops, together with the riggers' and bricklayers' shops, which are properly classified under the general shop department rather than with mechanical repairs.

5. The mechanical repairs department, which includes the various millwrights, machinists, and other repair men, who have no special station of work but go from department to department and do whatever work is necessary.

6. The shipping department, which includes also the various warehouses and other places of temporary storage.

7. The miscellaneous department, of which the larger number of employees are policemen and watchmen, the remainder being employees in various special occupations which could not be classified under any of the preceding departments.

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SUMMARY OF EARNINGS, HOURS, AND DAYS OF WORK.

EARNINGS.

The data relative to the earnings of employees in the power, mechanical, and yard force were reported for 65,744 employees, of whom nearly one-third (32.76 per cent) earned 16 and under 18 cents per hour. This was by far the largest single group earning the various classified amounts shown in the table below. The second largest group, including 15.05 per cent, earned 20 and under 25 cents per hour, while there were three groups of almost equal size earning, respectively, 14 and under 16 cents per hour, 18 and under 20 cents per hour, and 25 and under 30 cents per hour. Less than 2 per cent of all the employees earned 40 cents per hour and over, while 6.52 per cent earned under 14 cents per hour.

The per cent of employees in each district earning each classified amount per hour is shown in the table which follows:

PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: ALL DEPARTMENTS.

Districts.	Normal number of employees.	Per cent of employees earning each classified amount per hour.								
		Under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 cents and over.
New England	1,319	0.53	18.42	22.90	11.68	19.26	18.27	6.97	1.06	0.91
Eastern	7,365	16.02	26.67	16.85	6.97	13.29	12.80	6.34	.91	.15
Pittsburgh	34,955	5.53	9.92	35.19	13.37	14.79	9.66	9.66	1.61	.25
Great Lakes and Middle West	18,655	1.36	7.09	39.28	9.54	16.50	12.95	11.14	1.36	.80
Southern	3,364	27.20	25.12	10.94	5.17	11.09	8.09	9.19	.42	2.79
Pacific Coast	86	1.16	1.16	.....	.....	45.35	36.05	11.63	2.33	2.33
Total	65,744	6.52	11.93	32.76	11.10	15.05	11.07	9.63	1.39	.54

It will be seen that the different districts vary widely as regards proportion earning the different classified amounts per hour. For example, the proportion earning under 14 cents per hour was only 0.53 per cent in the New England district, while in the Eastern district 16.02 per cent and in the Southern district 27.20 per cent earned under 14 cents per hour. The relative distribution of earnings in the different districts, however, is more clearly shown in the summary in the form of cumulative percentages which follows:

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PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: ALL DEPARTMENTS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	1,319	0.53	18.95	41.85	53.53	72.78	91.05	98.03	99.09
Eastern	7,365	16.02	42.69	59.54	66.50	79.80	92.60	98.94	99.85
Pittsburgh	34,955	5.53	15.45	50.65	64.02	78.81	88.47	98.13	99.75
Great Lakes and Middle West	15,655	1.35	8.44	47.71	57.26	73.76	86.70	97.85	99.20
Southern	3,364	27.20	52.32	63.26	68.43	79.52	87.60	96.79	97.21
Pacific Coast	86	1.16	2.33	2.33	2.33	47.67	88.72	95.35	97.67
Total	65,744	6.52	18.45	51.22	62.31	77.36	88.43	98.07	99.46

The difference, it will be seen, between the different districts is to be found chiefly in the lower rates of earnings. For example, the Southern district has 52.32 per cent of all employees of the power, mechanical, and yard force earning under 16 cents per hour as compared with 42.69 per cent in the Eastern district, 18.95 per cent in the New England district, 15.45 per cent in the Pittsburgh district, and only 8.44 per cent in the Great Lakes and Middle West district. Of the 65,744 employees in the power, mechanical, and yard force in all districts, 51.22 per cent earned under 18 cents per hour and 77.36 per cent earned under 25 cents per hour. In considering the hourly earnings of this group of employees in comparison with the earnings of the employees in the productive occupations it should be noted that the hours of labor for the power, mechanical, and yard force are very much shorter than in the productive occupations, and that consequently the weekly earnings of the power, mechanical, and yard force would be relatively very much lower than in the productive occupations. For example, although the proportion earning under 18 cents in the productive occupations and in the power, mechanical, and yard force are approximately the same, 49.45 and 51.22 per cent, respectively, nevertheless, as 55.56 per cent of the employees in the power, mechanical, and yard force work 60 hours or less per week compared with 26.52 per cent in the productive occupations working 60 hours or less per week, the weekly earnings of the employees in the power, mechanical, and yard force are very much less than of those in the productive occupations.

HOURS OF LABOR.

In the power, mechanical, and yard force 55.56 per cent worked 60 hours or less per week, which is in fact a working day of 10 hours or less for 6 days per week. This fact alone serves to emphasize the difference between the working conditions for employees in this group and those in the productive occupations, of whom, it will be remembered, only 26.52 per cent worked 60 hours or less per week.

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The larger number of employees in the power, mechanical, and yard force are engaged in work which need not necessarily be completed at any specific time, and any continuous work day and night is altogether unnecessary.

The schedule of working hours, however, can very much better be discussed in connection with a consideration of the situation in the different departments, and it is therefore deferred until that point. A comparison of the general situation as regards customary working time in the different districts, however, can be made from the table which follows:

PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: ALL DEPARTMENTS.

Districts.	Normal number of employees.	Per cent of employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	1,319	0.68	2.12	2.96	77.56	8.57	2.27	2.65	3.18	0.61
Eastern	7,365	.03	13.51	19.21	38.40	12.72	6.71	3.73	5.33	.31
Pittsburgh	34,955	.27	3.15	12.78	32.02	15.32	14.91	7.52	13.61	.41
Great Lakes and Middle West	18,655	.51	1.02	3.32	50.94	19.59	11.22	2.18	10.83	.39
Southern	3,364	.48	.18	13.85	09.96	3.86	4.88	.09	6.45	.24
Pacific Coast	86	1.16	.....	95.35	.....	.....	.....	.....	3.49	.....
Total	65,744	.38	3.53	10.78	40.91	15.50	12.16	5.08	11.31	.39

DAYS PER WEEK.

Six days or turns was the customary working time of 72.88 per cent of the 65,744 employees in the power, mechanical, and yard force. Practically all of the other employees in this division of the industry were working 7 days or turns per week, a very few being reported as working the various other combinations of days or turns per week. As the employees in the power, mechanical, and yard force are in no way connected with production in the generation of power and the transportation of materials, there is no necessity for a very large number of these employees to be at work more than 6 days or turns per week. This, of course, does not apply to such occupations as gas-producer men and firemen, where the boilers and gas producers must be kept at work 7 days per week; but even in those departments, while the plant can not be shut down, it is entirely feasible through the plan recently introduced by the American Iron and Steel Institute to give each individual employed one day of rest per week. This plan has already been put into effect in a number of the different plants. The situation as regards the number of days or turns worked per week in the different districts of the industry is shown in the table which follows:

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PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: ALL DEPARTMENTS.

Districts.	Normal number of employees.	Per cent of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately	6 days.	6 and 7 days alternately	7 days.
New England	1,319	3.11	3.64	87.34	0.15	5.76
Eastern	7,365	3.67	7.32	[1] 78.32	.72	9.98
Pittsburgh	34,955	1.76	2.63	[2] 69.38	4.94	21.29
Great Lakes and Middle West	18,655	.55	3.17	73.13	.76	22.39
Southern	3,364	.....	2.02	89.60	.....	8.38
Pacific Coast	86	.....	.....	96.51	.....	3.49
Total	65,744	1.56	3.29	[3] 72.88	2.93	19.34

[1] Including 1 employee who worked 5 and 7 days alternately.
[2] Including 39 employees who worked 5 and 7 days alternately.
[3] Including 40 employees who worked 5 and 7 days alternately.

EARNINGS, HOURS, AND DAYS OF WORK, BY DEPARTMENTS.

STEAM, GAS, AND WATER.

EARNINGS.

Data relative to earnings were reported for 6,037 employees in the steam, gas, and water department. This group of employees includes chiefly the firemen and water tenders in the boiler houses, the gas-producer men in gas plants which are not attached to specific producing departments, the engineers and their assistants in the central steam-power plants, and, finally, the pump tenders and other employees connected with the water-supply department. Of all the employees in this department 81.78 per cent fall into the groups earning 16 and under 25 cents per hour. The employees earning 25 cents and more per hour constitute only 6.56 per cent of the total number, and those earning under 16 cents per hour constitute only 11.66 per cent of all the employees in this department.

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The table which follows shows for each district the number and per cent earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: STEAM, GAS, AND WATER.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.										
		Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 and under 60 cents.	60 and under 70 cents.
New England	159	.....	.....	13	27	54	49	15	1	.....	.....	.....
Eastern	529	3	23	140	162	81	83	27	10	.....	.....	.....
Pittsburgh	3,770	9	61	252	1,485	904	835	196	23	2	.....	3
Great Lakes and Middle West	1,479	.....	.....	147	702	270	261	84	15	.....	.....	.....
Southern	96	.....	36	20	12	4	8	12	4	.....	.....	.....
Pacific Coast	4	.....	.....	.....	.....	.....	.....	3	.....	1	.....	.....
Total	6,037	12	120	572	2,388	1,313	1,236	337	53	3	.....	3

PER CENT.

New England	159	.....	.....	8.18	16.98	33.96	30.82	9.43	0.63	.....	.....	.....
Eastern	529	0.57	4.35	26.47	30.62	15.31	15.69	5.10	1.89	.....	.....	.....
Pittsburgh	3,770	.24	1.62	6.68	39.39	23.96	22.15	5.20	.61	0.05	.....	0.08
Great Lakes and Middle West	1,479	.....	.....	9.94	47.46	18.26	17.65	5.68	1.01	.....	.....	.....
Southern	96	.....	37.50	20.83	12.50	4.17	8.33	12.50	4.17	.....	.....	.....
Pacific Coast	4	.....	.....	.....	.....	.....	.....	75.00	.....	25.00	.....	.....
Total	6,037	.20	1.99	9.47	39.56	21.75	20.47	5.58	.88	.05	.....	.05

It will be seen from the above table that there are wide variations between the different districts as regards relative earnings per hour of employees in this department. In the New England district 64.78 per cent of the employees earned 18 and less than 25 cents per hour; in the Eastern district 57.09 per cent of the employees earned 14 and less than 18 cents per hour, while in the Pittsburgh district 63.37 per cent and in the Great Lakes and Middle West district 65.72 per cent of the employees earned 16 and less than 20 cents per hour. In the Southern district, on the other hand, 58.33 per cent of the employees earned 12 and under 16 cents per hour.

The relative distribution of earnings in each district is, however, more clearly shown in the summary in the form of cumulative percentages which follows:

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PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: STEAM, GAS, AND WATER.

Districts.	Normal number of employees.	Per cent of employees earning per hour—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	159	.....	8.18	25.16	59.12	89.94	99.37	100.00	100.00
Eastern	529	4.91	31.38	62.00	77.32	93.01	98.11	100.00	100.00
Pittsburgh	3,770	1.86	8.54	47.93	71.91	94.06	99.26	99.87	99.92
Great Lakes and Middle West	1,479	.....	9.94	57.40	75.66	93.31	98.99	100.00	100.00
Southern	96	37.50	58.33	70.83	75.00	83.33	95.83	100.00	100.00
Pacific Coast	4	.....	.....	.....	.....	.....	75.00	75.00	100.00
Total	6,037	2.19	11.66	51.22	72.97	93.44	99.02	99.90	99.95

The chief differences between the different districts are to be found in the groups earning the lower hourly rates. In the Southern district, from which only a very few employees, however, were reported, 37.50 per cent of all employees were earning less than 14 cents per hour, while none of the other districts shows as much as 5 per cent earning less than this amount. In the Eastern district 31.38 per cent of the employees earned less than 16 cents per hour, which is more than three times as large a proportion earning less than 16 cents per hour than in either the New England, the Pittsburgh, or the Great Lakes and Middle West district. These differences, however, are much less marked in the groups earning the higher amounts per hour, because there is very little variation in the wages paid the more highly skilled workmen in these occupations in the different districts.

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to the customary working hours per week were reported for 6,037 employees in the steam, gas, and water department. More than one-half (52.34 per cent) of the employees in this department were customarily working 84 hours or more per week. This group of employees includes for the most part firemen on stationary engines and gas-producer men, whose duties require that some employee shall be on duty day and night whenever the plant is operated and that a small proportion at least shall be on duty to keep the fires up even when the plant is not operated. Of the employees in this department 1.34 per cent were working less than 60 hours per week. There is considerable variation between the different districts as regards the customary working time in this department. This, however, is due in a large part to the fact that in the New England district and the Eastern district the proportion of blast furnaces is relatively small, and it is in connection with the blast-furnace depart-

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ment particularly that the employees are required to work 84 hours or more per week.

The table which follows shows for each district the number and per cent of employees working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: STEAM, GAS, AND WATER.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	159	.....	.....	.....	42	59	29	8	21	.....
Eastern	529	.....	7	10	60	149	80	43	179	1
Pittsburgh	3,770	3	7	46	214	338	657	537	1,962	6
Great Lakes and Middle West	1,479	.....	7	.....	110	171	153	120	917	1
Southern	96	.....	.....	.....	19	1	6	.....	63	7
Pacific Coast	4	.....	.....	1	.....	.....	.....	.....	3	.....
Total	6,037	3	21	57	445	718	925	708	3,145	15

PER CENT.

New England	159	.....	.....	.....	26.42	37.11	18.24	5.03	13.21	.....
Eastern	529	.....	1.32	1.89	11.34	28.17	15.12	8.13	33.84	0.19
Pittsburgh	3,770	0.08	.19	1.22	5.68	8.97	17.43	14.24	52.04	.16
Great Lakes and Middle West	1,479	.....	.47	.....	7.44	11.56	10.34	8.11	62.00	.07
Southern	96	.....	.....	.....	19.79	1.04	6.25	.....	65.63	7.29
Pacific Coast	4	.....	.....	25.00	.....	.....	.....	.....	75.00	.....
Total	6,037	.05	.35	.94	7.37	11.89	15.32	11.73	52.10	.25

DAYS WORKED PER WEEK.

Seven days or turns was the customary working time per week for 58.65 per cent of the employees in the steam, gas, and water department. There was considerable variation as regards the proportion of employees in this department working 7 days or turns per week in the different districts, arising largely from the fact that in the New England and the Eastern districts a large number of the plants are simply rolling mills, which do not require the fires under the boilers to be kept up continuously throughout the week.

The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

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NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: STEAM, GAS, AND WATER.

Districts.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	159	.....	47	82	2	28	.....	29.56	51.57	1.26	17.61
Eastern	529	10	78	[1] 197	35	209	1.89	14.74	[1] 37.24	6.62	39.51
Pittsburgh	3,770	25	64	[2] 1,048	427	2,206	.66	1.70	[2] 27.80	11.33	58.51
Great Lakes and Middle West	1,479	17	52	322	63	1,024	1.15	3.52	21.84	4.26	69.24
Southern	96	.....	.....	25	.....	71	.....	.....	26.04	.....	73.96
Pacific Coast	4	.....	.....	1	.....	3	.....	.....	25.00	.....	75.00
Total	6,037	52	241	[3] 1,676	527	3,541	.86	3.99	[3] 27.76	8.73	58.65

[1] Including 1 employee who worked 5 and 7 days alternately.
[2] Including 6 employees who worked 5 and 7 days alternately.
[3] Including 7 employees who worked 5 and 7 days alternately.

YARD AND TRANSPORTATION.

EARNINGS.

Data relative to earnings were reported for 22,855 employees in the yard and transportation department. These employees are for the most part common, unskilled laborers employed at various jobs throughout the plant, as is shown by the fact that 81.30 per cent of all employees in this department were reported as earning less than 18 cents per hour. The largest single group of employees, including 52.36 per cent of the total, earned 16 and under 18 cents per hour. In the Pittsburgh and the Great Lakes and Middle West districts, which include more than three-fourths of all the employees in this department, the standard rate for common, unskilled labor in the majority of plants ranges between 16 and 18 cents, the highest rate customarily paid being 17½ cents per hour. This department also includes the locomotive engineers and other employees concerned with the yard transportation and switches, except those who have already been considered in connection with the various producing departments. Practically all of the employees earning more than 20 cents per hour are connected with the transportation branch of this department.

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The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: YARD AND TRANSPORTATION.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.											
		Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 and under 60 cents.	60 and under 70 cents.	70 cents and over.
New England	464	.....	.....	135	155	33	64	6	16	.....	.....	.....	.....
Eastern	2,570	46	616	1,208	220	171	221	71	17	.....	.....	.....	.....
Pittsburgh	11,662	77	996	1,265	7,152	703	648	533	209	3	.....	.....	1
Great Lakes and Middle West	6,467	4	26	774	4,344	258	661	294	63	1	.....	12	.....
Southern	1,630	59	602	674	97	16	84	7	1	.....	.....	.....	.....
Pacific Coast	62	.....	.....	.....	.....	.....	30	20	3	.....	.....	.....	.....
Total	22,855	186	2,330	4,096	11,968	1,184	1,715	960	309	4	.....	12	1

PER CENT.

New England	464	.....	.....	30.87	33.41	8.19	13.79	1.29	3.45	.....	.....	.....	.....
Eastern	2,570	1.79	23.97	47.00	8.56	6.65	8.60	2.76	.66	.....	.....	.....	.....
Pittsburgh	11,662	.66	8.54	10.76	61.33	6.01	5.54	4.56	2.56	0.03	.....	.....	0.01
Great Lakes and Middle West	6,467	.06	.40	11.97	67.17	3.99	10.22	5.01	.97	.02	.....	0.19	.....
Southern	1,630	3.62	42.45	41.35	5.95	.98	5.15	.43	.06	.....	.....	.....	.....
Pacific Coast	62	.....	.....	.....	.....	.....	62.90	32.26	4.84	.....	.....	.....	.....
Total	22,855	.81	10.19	17.92	52.36	5.18	7.50	4.20	1.75	.02	.....	.08	(1)

[1] Less than one-hundredth of 1 per cent.

A comparison of the earnings in the different districts can more readily be made from the summary in the form of cumulative percentages which is shown below. From this table it will be seen that there are very wide variations between the different districts. The lowest general level of earnings is reported for the Southern district, in which 93.37 per cent of all the employees earned less than 18 cents per hour and 46.07 per cent earned less than 14 cents per hour. Excluding the Pacific Coast district, for which only a small number of employees were reported, the general level of earnings was highest in the Great Lakes and Middle West district, although there was not a very marked difference between the general level of earnings in this district and the Pittsburgh district.

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PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: YARD AND TRANSPORTATION.

Districts.	Normal number of employees.	Per cent of employees earning per hour—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	464	.....	39.87	73.28	81.47	95.26	96.55	100.00	100.00
Eastern	2,570	25.76	72.76	81.32	87.98	96.58	99.34	100.00	100.00
Pittsburgh	11,662	9.20	19.96	81.29	87.30	92.84	97.40	99.97	99.99
Great Lakes and Middle West	6,467	.46	12.43	79.60	83.59	93.81	98.82	99.80	99.81
Southern	1,630	46.07	87.42	93.37	94.36	99.51	99.94	100.00	100.00
Pacific Coast	62	.....	.....	.....	.....	62.90	95.16	100.00	100.00
Total	22,855	11.01	28.93	81.30	86.48	93.98	98.18	99.93	99.94

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to the customary working time were reported for 22,855 employees in the yard and transportation department. The larger number of these employees were common, unskilled laborers, working at various tasks in the yards and in connection with the different producing departments. The larger number of these common laborers were employed for 10 hours per day or less 6 days per week. This is evident from the fact that 56.55 per cent of the employees in this department were working 60 hours or less per week. The employees reported as working 72 hours or more per week were chiefly workmen connected with the yard transportation system of the steel plants. The proportion of employees in this department working 72 hours or more per week varied considerably in the different districts, but this was due in a large part to the fact that in the Pittsburgh and the Great Lakes and Middle West districts, which show the largest proportion of employees working more than 72 hours per week, are located a larger number of large steel plants which have elaborate yard transportation systems. In the smaller plants, in the New England, the Eastern, and the Southern districts, only a very small proportion of the employees are required to operate the very limited transportation equipment which these plants contain.

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The table which follows shows for each district the number and per cent of employees working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: YARD AND TRANSPORTATION.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	464	.....	.....	.....	417	34	.....	11	1	1
Eastern	2,570	.....	320	612	1,044	300	69	173	50	2
Pittsburgh	11,662	6	399	1,344	4,000	1,948	2,024	636	1,299	6
Great Lakes and Middle West	6,467	46	4	373	2,793	1,326	1,326	58	516	25
Southern	1,630	.....	.....	372	1,132	2	17	.....	107	.....
Pacific Coast	62	.....	.....	62	.....	.....	.....	.....	.....	.....
Total	22,855	52	723	2,763	9,386	3,610	3,436	878	1,973	34

PER CENT.

New England	464	.....	.....	.....	89.87	7.33	.....	2.37	0.22	0.22
Eastern	2,570	.....	12.45	23.81	40.62	11.67	2.68	6.73	1.95	.08
Pittsburgh	11,662	0.05	3.42	11.52	34.30	16.70	17.36	5.45	11.14	.05
Great Lakes and Middle West	6,467	.71	.06	5.77	43.19	20.50	20.50	.90	7.98	.39
Southern	1,630	.....	.....	22.82	69.45	.12	1.04	.....	6.56	.....
Pacific Coast	62	.....	.....	100.00	.....	.....	.....	.....	.....	.....
Total	22,855	.23	3.16	12.09	41.07	15.80	15.03	3.84	8.63	.15

DAYS WORKED PER WEEK.

Of the 22,855 employees in the yard and transportation department only 16.41 per cent customarily worked 7 days or turns per week. There was considerable variation between the different districts as regards the proportion of employees in this department who worked 7 days or turns per week. The Southern and the Eastern districts showed a much smaller proportion working 7 days or turns per week than either the Pittsburgh or the Great Lakes and Middle West district.

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The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: YARD AND TRANSPORTATION.

Districts.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	464	6	.....	454	.....	4	1.29	.....	97.84	.....	0.86
Eastern	2,570	75	194	2,228	2	271	2.92	7.55	78.91	0.08	10.54
Pittsburgh	11,662	173	503	[1] 8,158	754	2,074	1.48	4.31	[1] 69.95	6.47	17.78
Great Lakes and Middle West	6,467	56	211	4,878	30	1,292	.87	3.26	75.43	.46	19.98
Southern	1,630	.....	.....	1,520	.....	110	.....	.....	93.25	.....	6.75
Pacific Coast	62	.....	.....	62	.....	.....	.....	.....	100.00	.....	.....
Total	22,855	310	908	[1] 17,100	786	3,751	1.36	3.97	[1] 74.82	3.44	16.41

[1] Including 24 employees who worked 5 and 7 days alternately.

ELECTRIC POWER AND REPAIRS.

EARNINGS.

Data relative to earnings were reported for 3,221 employees in the electric power and repairs department. The larger number of employees in this department were skilled workmen, such as electricians and motor inspectors, together with their helpers, of whom the larger number are at least semiskilled. This is clearly shown by the fact that in this department 75.54 per cent of all the employees earned 20 cents or more per hour, and 12.88 per cent earned 30 cents or more per hour. These proportions are in striking contrast with the facts which have been shown for most of the other departments.

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The table which follows shows for each district the number and per cent earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: ELECTRIC POWER AND REPAIRS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.								
		Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.
New England	39	.....	.....	.....	.....	2	14	19	4	.....
Eastern	333	22	9	33	54	21	78	83	33	.....
Pittsburgh	1,636	9	13	41	136	195	574	465	202	1
Great Lakes and Middle West	1,091	19	11	16	94	82	335	382	151	1
Southern	122	5	3	1	4	18	32	36	22	1
Total	3,221	55	36	91	288	318	1,033	985	412	3

PER CENT.

New England	39	.....	.....	.....	.....	5.13	35.90	48.72	10.26	.....
Eastern	333	6.61	2.70	9.91	16.22	6.31	23.42	24.92	9.91	.....
Pittsburgh	1,636	.55	.79	2.51	8.31	11.92	35.09	28.42	12.35	0.06
Great Lakes and Middle West	1,091	1.74	1.01	1.47	8.62	7.52	30.71	35.01	13.84	.09
Southern	122	4.10	2.46	.82	3.28	14.75	26.23	29.51	18.03	.82
Total	3,221	1.71	1.12	2.83	8.94	9.87	32.07	30.58	12.79	.09

The most striking fact shown in this table and in the summary in the form of cumulative percentages which follows is the fact that, with very few exceptions, there are no marked variations between the general level of earnings for this class of employees in the different districts. The one important exception is to be found in the Eastern district, where the general level of earnings is decidedly lower than in the other districts. It must be remembered, however, that this district includes only New Jersey and the eastern section of Pennsylvania, where there is the largest supply of labor of this class relative to the general demand for it. In the Southern district, on the other hand, which in most of the other departments shows a much lower level of earnings than any of the other districts, the situation is to some extent reversed in the case of the electricians and other employees in this department. For example, 18.85 per cent of the employees in the Southern district earned 30 cents or more per hour, while none of the other districts reported more than 14 per cent as earning as much as 30 cents per hour.

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PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: ELECTRIC POWER AND REPAIRS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	39	.....	.....	.....	5.13	41.03	89.74	100.00	100.00
Eastern	333	9.31	19.22	35.44	41.74	65.17	90.09	100.00	100.00
Pittsburgh	1,636	1.34	3.85	12.16	24.08	59.17	87.59	99.94	100.00
Great Lakes and Middle West	1,091	2.75	4.22	12.83	20.35	51.05	86.07	99.91	100.00
Southern	122	6.56	7.38	10.66	25.41	51.64	81.15	99.18	100.00
Total	3,221	2.83	5.65	14.59	24.46	56.54	87.12	99.91	100.00

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to the customary working time were reported for 3,221 employees in the electric power and repairs department. This department includes two groups of employees, whose working hours are quite different. The first group includes, chiefly, the electricians, motor inspectors, and others whose ordinary working time is limited to approximately 10 hours per day for 6 days or turns per week. This group includes practically all of the employees working less than 72 hours per week, of whom there were 67.56 per cent. The second group includes the various dynamo and motor tenders and others employed at the central electric generating station whose duties require constant attendance while the plant is in operation. This group includes most of those reported as working 72 hours and over per week, of whom there were 32.44 per cent, although a few of the electricians and others engaged solely in repairs were also working more than 72 hours per week.

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The table which follows shows for each district the number and per cent of employees working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: ELECTRIC POWER AND REPAIRS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	39	.....	.....	.....	32	3	1	1	.....	2
Eastern	333	2	34	111	105	21	16	22	20	2
Pittsburgh	1,636	.....	5	123	430	352	226	126	356	18
Great Lakes and Middle West	1,091	1	.....	11	630	208	31	32	169	9
Southern	122	.....	.....	.....	107	1	2	2	9	1
Total	3,221	3	39	245	1,304	585	276	183	554	32

PER CENT.

New England	39	.....	.....	.....	82.05	7.69	2.56	2.56	.....	5.13
Eastern	333	0.60	10.21	33.33	31.53	6.31	4.80	6.61	6.01	.60
Pittsburgh	1,636	.....	.31	7.52	26.28	21.52	13.81	7.70	21.76	1.10
Great Lakes and Middle West	1,091	.09	.....	1.01	57.75	19.07	2.84	2.93	15.49	.82
Southern	122	.....	.....	.....	87.70	.82	1.64	1.64	7.38	.82
Total	3,221	.09	1.21	7.61	40.48	18.16	8.57	5.68	17.20	.99

DAYS WORKED PER WEEK.

Of the 3,221 employees in the electric power and repairs department 28.97 per cent were reported as working 7 days or turns per week. The larger number of these employees who worked 7 days or turns per week were employed at the central electric-generating station, although this group also included a number of electricians and motor inspectors whose duties required them to work 7 days or turns per week.

The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

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NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: ELECTRIC POWER AND REPAIRS.

Districts.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	39	.....	1	35	.....	3	.....	2.56	89.74	.....	7.69
Eastern	333	8	20	262	14	29	2.40	6.01	78.68	4.20	8.71
Pittsburgh	1,636	1	19	943	89	584	.06	1.16	57.64	5.44	35.70
Great Lakes and Middle West	1,091	4	12	759	12	304	.37	1.10	69.57	1.10	27.86
Southern	122	.....	.....	109	.....	13	.....	.....	89.34	.....	10.66
Total	3,221	13	52	2,108	115	933	.40	1.61	65.45	3.57	28.97

SHOPS.

EARNINGS.

Data relative to earnings were reported for 22,588 employees in the various shops connected with steel works and rolling mills. These shops are of very diverse character, the most important being the machine shop, boiler shop, blacksmith shop, carpenter shop, and the bricklayers' and riggers' shops. Owing to the wide diversity of skill required in these various shops, the range of earnings is very much wider in this department than in any other of the nonproducing departments. A few of the employees, including 0.08 of 1 per cent of the total number, earned as much as 70 cents per hour, and 1.89 per cent earned less than 12 cents per hour. Of all the employees, however, 57.18 per cent were in the groups earning 20 and less than 40 cents per hour. The employees in this department earning less than 18 cents per hour are of two general classes: First, various unskilled helpers to the more highly skilled workmen; and, second, the apprentices and other boys who may be learning the trade, although they are not definitely apprenticed.

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The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: SHOPS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.											
		Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 and under 60 cents.	60 and under 70 cents.	70 cents and over.
New England	527	2	1	29	78	51	91	188	63	13	7	4	.....
Eastern	2,671	96	227	316	360	168	428	628	370	67	10	.....	1
Pittsburgh	10,761	178	324	805	1,437	1,385	1,742	1,631	2,630	545	65	14	5
Great Lakes and Middle West	7,453	127	51	205	1,378	802	1,308	1,439	1,783	248	63	40	11
Southern	1,164	22	48	56	218	104	179	172	259	12	82	12	.....
Pacific Coast	12	1	.....	1	.....	.....	.....	3	4	1	1	1	.....
Total	22,588	426	651	1,412	3,471	2,510	3,746	4,061	5,109	886	228	71	17

PER CENT.

New England	527	0.38	0.19	5.50	14.80	9.68	17.27	35.67	11.95	2.47	1.33	0.76	.....
Eastern	2,671	3.59	8.50	11.83	13.48	6.29	16.02	23.51	13.85	2.51	.37	.....	0.04
Pittsburgh	10,761	1.65	3.01	7.48	13.35	12.87	16.19	15.16	24.44	5.06	.60	.13	.05
Great Lakes and Middle West	7,453	1.70	.68	2.75	18.49	10.76	17.52	19.31	23.92	3.33	.85	.54	.15
Southern	1,164	1.89	4.12	4.81	18.73	8.93	15.38	14.78	22.25	1.03	7.04	1.03	.....
Pacific Coast	12	8.33	.....	8.33	.....	.....	.....	25.00	33.33	8.33	8.33	8.33	.....
Total	22.588	1.89	2.88	6.25	15.37	11.11	16.58	17.98	22.62	3.92	1.01	.31	.08

A comparison of the different districts in the table above and in the summary in the form of cumulative percentages which follows shows in a very striking manner the fact which has already been emphasized in the discussion of previous departments, viz, that for the more highly skilled employees there is a very definite tendency to standardize wages throughout the country, which is in marked contrast to the very wide variations which exist in the wages paid unskilled laborers and also the highly specialized workmen in the productive occupations. This table also brings out clearly the lower general level of earnings for the more highly skilled workmen which exist in the New England and the Eastern districts as compared with the other sections of the country.

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PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: SHOPS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	527	0.57	6.07	20.87	30.55	47.82	83.49	96.45	97.91
Eastern	2,671	12.09	23.92	37.40	43.69	59.72	83.23	97.08	99.59
Pittsburgh	10,761	4.67	12.15	25.50	38.37	54.56	69.71	94.15	99.22
Great Lakes and Middle West	7,453	2.39	5.14	23.63	34.39	51.91	71.22	95.14	98.47
Southern	1,164	6.01	10.82	29.55	38.49	53.87	68.64	90.89	91.92
Pacific Coast	12	8.33	16.67	16.67	16.67	16.67	41.67	75.00	83.33
Total	22,588	4.77	11.02	26.39	37.50	54.08	72.06	94.68	98.60

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to the customary working hours were reported for 22,588 employees in the shop department. The 10-hour day was the customary working time for the larger number of these establishments, as is shown by the fact that 57.89 per cent of the employees in this department were working 60 hours per week. Nearly one-fifth (19.4 per cent) of the employees in this department were working less than 10 hours per day while 22.7 per cent were working more than 60 hours per week. The different districts show considerable variations as regards the customary working hours in the shop department. In the Pittsburgh district, for example, 28.28 per cent of the employees customarily worked less than 60 hours per week, while only 4.25 per cent of the employees in the Great Lakes and Middle West district were working less than 60 hours. The Pittsburgh district, however, shows 14.34 per cent of the employees in the shop department working 72 hours or more per week, against 4.64 per cent in the shop department of the Great Lakes and Middle West district.

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The table which follows shows for each district the number and per cent of employees working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: SHOPS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	527	9	28	9	464	7	.....	7	.....	3
Eastern	2,671	.....	500	379	1,449	276	18	20	21	8
Pittsburgh	10,761	64	588	2,391	4,943	1,232	722	612	120	89
Great Lakes and Middle West	7,453	48	134	135	5,351	1,439	134	97	100	15
Southern	1,164	16	6	64	869	76	130	1	2	.....
Pacific Coast	12	1	.....	11	.....	.....	.....	.....	.....	.....
Total	22,588	138	1,256	2,989	13,076	3,030	1,004	737	243	115

PER CENT.

New England	527	1.71	5.31	1.71	88.05	1.33	.....	1.33	.....	0.57
Eastern	2,671	.....	18.72	14.19	54.25	10.33	0.67	.75	0.79	.30
Pittsburgh	10,761	.59	5.46	22.22	45.93	11.45	6.71	5.69	1.12	.83
Great Lakes and Middle West	7,453	.64	1.80	1.81	71.80	19.31	1.80	1.30	1.34	.20
Southern	1,164	1.37	.52	5.50	74.66	6.53	11.17	.09	.17	.....
Pacific Coast	12	8.33	.....	91.67	.....	.....	.....	.....	.....	.....
Total	22,588	.61	5.56	13.23	57.89	13.41	4.44	3.26	1.08	.51

DAYS WORKED PER WEEK.

Of the 22,588 employees in the shop department 8.81 per cent were reported as customarily working 7 days or turns per week. This rather large proportion of employees working 7 days or turns per week in the shops was due in a large part to the fact that a few establishments of considerable size were working practically their entire shop force on Sunday as well as on week days. This condition, it will be remembered, was one of the chief causes of complaint in the strike at the Bethlehem Steel Works which occurred early in 1910. A larger proportion of employees in the Great Lakes and Middle West district than in any of the other districts was reported as working 7 days or turns per week.

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The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: SHOPS.

Districts.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	527	33	.....	484	.....	10	6.26	.....	91.84	.....	1.90
Eastern	2,671	163	85	2,358	.....	65	6.10	3.18	88.28	.....	2.43
Pittsburgh	10,761	256	110	9,234	249	912	2.38	1.02	85.81	2.31	8.48
Great Lakes and Middle West	7,453	17	18	6,443	4	971	.23	.24	86.45	.05	13.03
Southern	1,164	.....	37	1,094	.....	33	.....	3.18	93.99	.....	2.84
Pacific Coast	12	.....	.....	12	.....	.....	.....	.....	100.00	.....	.....
Total	22,588	469	250	19,625	253	1,991	2.08	1.11	86.88	1.12	8.81

MECHANICAL REPAIRS.

EARNINGS.

Data relative to earnings were reported for 3,864 employees in the mechanical repairs department. This class of employees includes the various machinists, millwrights, and other mechanics who make mechanical repairs for the various producing departments. These men are not definitely attached to shops, but go from department to department and do such work as may be necessary. These highly skilled workmen have a number of unskilled or partly skilled helpers, who are included in the class of employees earning less than 18 cents per hour.

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The table which follows shows for each district the number and per cent earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: MECHANICAL REPAIRS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.											
		Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 and under 60 cents.	60 and under 70 cents.	70 cents and over.
New England	43	.....	.....	.....	5	8	17	8	5	.....	.....	.....	.....
Eastern	386	6	7	37	37	24	131	110	34	.....	.....	.....	.....
Pittsburgh	2,359	1	13	411	244	410	701	397	174	7	.....	.....	1
Great Lakes and Middle West	853	.....	.....	1	104	191	375	104	54	1	23	.....	.....
Southern	223	1	7	21	33	29	64	45	22	1	.....	.....	.....
Total	3,864	8	27	470	423	662	1,288	664	289	9	23	.....	1

PER CENT.

New England	43	.....	.....	.....	11.63	18.60	39.53	18.60	11.63	.....	.....	.....	.....
Eastern	386	1.55	1.81	9.59	9.59	6.22	33.94	28.50	8.81	.....	.....	.....	.....
Pittsburgh	2,359	.04	.55	17.42	10.34	17.38	29.72	16.83	7.38	0.30	.....	.....	0.04
Great Lakes and Middle West	853	.....	.....	.12	12.19	22.39	43.96	12.19	6.33	.12	2.70	.....	.....
Southern	223	.45	3.14	9.42	14.80	13.00	28.70	20.18	9.87	.45	.....	.....	.....
Total	3,864	.21	.70	12.16	10.95	17.13	33.33	17.18	7.48	.23	.60	.....	.03

It will be seen from this table and the summary in the form of cumulative percentages which follows that the variations as regards earnings in the different districts occur chiefly in the groups earning the lower classified rates. It is rather interesting to note that in the Pittsburgh district there seems to be a decided tendency to use a larger proportion of unskilled helpers than in any of the other districts as is shown by the fact that 28.36 per cent of the employees in that district earned less than 18 cents per hour. In the Southern district, where practically all unskilled helpers are paid less than 16 cents per hour, only 13 per cent were reported as earning less than 16 cents per hour.

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PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: MECHANICAL REPAIRS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	43	.....	.....	11.63	30.23	69.77	88.37	100.00	100.00
Eastern	386	3.37	12.95	22.54	28.76	62.69	91.19	100.00	100.00
Pittsburgh	2,359	.59	18.02	28.36	45.74	75.46	92.28	99.66	99.96
Great Lakes and Middle West	853	.....	.12	12.31	34.70	78.66	90.86	97.19	97.30
Southern	223	3.59	13.00	27.80	40.81	69.51	89.69	99.55	100.00
Total	3,864	.91	13.07	24.02	41.15	74.48	91.67	99.15	99.38

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to the customary working hours were reported for 3,864 employees in the mechanical repairs department. Of the employees in this department, 61.18 per cent worked 60 hours and less than 72 hours per week; 27.33 per cent, however, were employed for 72 hours or more per week, and 11.23 per cent were customarily working 84 hours per week or more.

The table which follows shows for each district the number and per cent of employees working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: MECHANICAL REPAIRS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—							
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	43	.....	.....	.....	33	9	.....	.....	1	.....
Eastern	386	.....	80	156	69	17	25	4	32	3
Pittsburgh	2,359	3	21	153	586	798	229	236	322	11
Great Lakes and Middle West	853	.....	1	.....	483	192	32	87	52	6
Southern	223	.....	.....	30	161	16	9	.....	7	.....
Total	3,864	3	102	339	1,332	1,032	295	327	414	20

PER CENT.

New England	43	.....	.....	.....	76.74	20.93	.....	.....	2.33	.....
Eastern	386	.....	20.73	40.41	17.88	4.40	6.48	1.04	8.29	0.78
Pittsburgh	2,359	0.13	.89	6.49	24.84	33.83	9.71	10.00	13.65	.07
Great Lakes and Middle West	853	.....	.12	.....	56.62	22.51	3.75	10.20	6.10	.70
Southern	223	.....	.....	13.45	72.20	7.17	4.04	.....	3.14	.....
Total	3,864	.08	2.64	8.77	34.47	26.71	7.63	8.46	10.71	.82

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DAYS WORKED PER WEEK.

Of the 3,864 employees in the mechanical repair department 23.65 per cent worked 7 days or turns per week. It is undoubtedly necessary for a great deal of the repair work in steel works to be done on Saturday night and Sunday while the producing departments are not in operation, but it is equally true that there is no reason why arrangements should not be made to give every man engaged in this kind of work at least one day of rest per week. The largest proportion of employees reported as working 7 days or turns per week was in the Great Lakes and Middle West district.

The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: MECHANICAL REPAIRS.

Districts.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	43	1	.....	32	.....	10	2.33	.....	74.42	.....	23.26
Eastern	386	6	3	338	.....	39	1.55	0.78	87.56	.....	10.10
Pittsburgh	2,359	7	22	[1] 1,587	193	550	.30	.93	[1] 67.27	8.18	23.31
Great Lakes and Middle West	853	3	6	529	23	292	.35	.70	62.02	2.70	34.23
Southern	223	.....	.....	200	.....	23	.....	.....	89.69	.....	10.31
Total	3,864	17	31	[1] 2,686	216	914	.44	.80	[1] 69.51	5.59	23.65

[1] Including 9 employees who worked 5 and 7 days alternately.

SHIPPING.

EARNINGS.

Data relative to earnings were reported for 4,618 employees in the shipping department of the steel works and rolling mills. This department, it should be noted, does not include all of the employees in the industry connected with shipping, as a large number of them were reported as working for certain specific producing departments, and they have already been considered in connection therewith. The majority of the employees in this department were unskilled, as is shown by the fact that 63.71 per cent of the total number earned less than 18 cents per hour, and less than 1 per cent earned as much as 30 cents per hour.

The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

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NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: SHIPPING.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.									
		Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 and under 60 cents.
New England	61	4	.....	9	32	.....	8	4	3	.....	1
Eastern	451	7	34	191	140	30	27	22	.....	.....	.....
Pittsburgh	3,604	7	137	421	1,654	755	487	117	25	1	.....
Great Lakes and Middle West	433	.....	2	35	216	68	82	20	9	1	.....
Southern	61	.....	23	29	1	1	6	.....	1	.....	.....
Pacific Coast	8	.....	.....	.....	.....	.....	.....	5	3	.....	.....
Total	4,618	18	196	685	2,043	854	610	168	41	2	1

PER CENT.

New England	61	6.56	.....	14.75	52.46	.....	13.11	6.56	4.92	.....	1.64
Eastern	451	1.55	7.54	42.35	31.04	6.65	5.99	4.88	.....	.....	.....
Pittsburgh	3,604	.19	3.80	11.68	45.89	20.95	13.51	3.25	.69	0.03	.....
Great Lakes and Middle West	433	.....	.46	8.08	49.88	15.70	18.94	4.62	2.08	.23	.....
Southern	61	.....	37.70	47.54	1.64	1.64	9.84	.....	1.64	.....	.....
Pacific Coast	8	.....	.....	.....	.....	.....	.....	62.50	37.50	.....	.....
Total	4,618	.39	4.24	14.83	44.24	18.49	13.21	3.64	.89	.04	.02

The above table as well as the summary in the form of cumulative percentages which follows shows the wide variations between the different districts as regards the relative rates paid.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: SHIPPING.

Districts.	Normal number of employees.	Per cent of employees earning per hour—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	61	6.56	21.31	73.77	73.77	86.89	93.44	98.36	98.36
Eastern	451	9.09	51.44	82.48	89.14	95.12	100.00	100.00	100.00
Pittsburgh	3,604	4.00	15.68	61.57	82.52	96.03	99.28	99.97	100.00
Great Lakes and Middle West	433	.46	8.55	58.43	74.13	93.07	97.69	99.77	100.00
Southern	61	37.70	85.25	86.89	88.52	98.36	98.36	100.00	100.00
Pacific Coast	8	.....	.....	.....	.....	.....	62.50	100.00	100.00
Total	4,618	4.63	19.47	63.71	82.20	95.41	99.05	99.94	99.98

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to the customary working hours were reported for 4,618 employees in the shipping department. A very few of the employees in this department worked more than 72 hours per week, and the larger part worked less than 72 hours.

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The table which follows shows for each district the number and per cent of employees working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: SHIPPING.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—							
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.
New England	61	.....	.....	30	31	.....	.....	.....	.....
Eastern	451	.....	51	135	94	132	32	7	.....
Pittsburgh	3,604	.....	73	386	941	626	1,298	274	6
Great Lakes and Middle West	433	.....	22	54	106	92	132	6	19
Southern	61	.....	.....	.....	30	31	.....	.....	.....
Pacific Coast	8	.....	.....	8	.....	.....	.....	.....	.....
Total	4,618	.....	146	613	1,204	881	1,462	287	25

PER CENT.

New England	61	.....	.....	49.18	50.82	.....	.....	.....	.....
Eastern	451	.....	11.31	29.93	20.84	29.27	7.10	1.55	.....
Pittsburgh	3,604	.....	2.03	10.71	26.11	17.37	36.02	7.60	0.17
Great Lakes and Middle West	433	.....	5.08	12.47	24.94	21.25	30.48	1.39	4.39
Southern	61	.....	.....	.....	49.18	50.82	.....	.....	.....
Pacific Coast	8	.....	.....	100.00	.....	.....	.....	.....	.....
Total	4,618	.....	3.16	13.27	26.07	19.08	31.66	6.21	.54

DAYS WORKED PER WEEK.

Of the 4,618 employees in the shipping department only 5.95 per cent were working 7 days or turns per week, while 12.82 per cent were reported as working less than 6 full days or turns per week.

The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: SHIPPING.

Districts.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	61	.....	.....	61	.....	.....	.....	.....	100.00	.....	.....
Eastern	451	7	151	286	.....	7	1.55	33.48	63.41	.....	1.55
Pittsburgh	3,604	147	183	3,022	6	246	4.08	5.08	83.85	0.17	6.83
Great Lakes and Middle West	433	4	69	332	6	22	.92	15.94	76.67	1.39	5.08
Southern	61	.....	31	30	.....	.....	.....	50.82	49.18	.....	.....
Pacific Coast	8	.....	.....	8	.....	.....	.....	.....	100.00	.....	.....
Total	4,618	158	434	3,739	12	275	3.42	9.40	80.97	.26	5.95

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MISCELLANEOUS.

EARNINGS.

Data relative to earnings were reported for 2,561 employees in the various occupations which have here been classified as constituting a miscellaneous department. The larger number of these employees were watchmen, together with a large number of boys and unskilled laborers whose duties consisted chiefly in running errands and doing miscellaneous chores which brought them directly in contact with the various producing operations. This fact clearly distinguishes them from the ordinary office and messenger boys and makes it proper that they should be included here. The general level of earnings for the employees in this department was relatively low, 66.34 per cent of the total number earning less than 18 cents per hour. The boys included in this department are largely included in the groups earning less than 14 cents per hour, except in the Southern district, where a number of watchmen and various other unskilled adults were paid less than that amount per hour.

The table which follows shows for each district the number and per cent of employees earning each classified amount per hour:

NUMBER AND PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: MISCELLANEOUS.

NUMBER.

Districts.	Normal number of employees.	Employees earning each classified amount per hour.								
		Under 12 cents.	12 and under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.
New England	26	.....	.....	7	5	1	11	1	.....	1
Eastern	425	13	71	39	268	18	11	2	3	.....
Pittsburgh	1,163	69	40	283	193	325	185	40	23	5
Great Lakes and Middle West	879	2	10	144	489	109	58	62	4	1
Southern	68	1	18	44	3	2	.....	.....	.....	.....
Total	2,561	85	139	517	958	455	265	105	30	7

PER CENT.

New England	26	.....	.....	26.92	19.23	3.85	42.31	3.85	.....	3.85
Eastern	425	3.06	16.71	9.18	63.06	4.24	2.59	.47	0.71	.....
Pittsburgh	1,163	5.93	3.44	24.33	16.60	27.94	15.91	3.44	1.98	.43
Great Lakes and Middle West	879	.23	1.14	16.38	55.63	12.40	6.60	7.05	.46	.11
Southern	68	1.47	26.47	64.71	4.41	2.94	.....	.....	.....	.....
Total	2,561	3.32	5.43	20.19	37.41	17.77	10.35	4.10	1.17	.27

In the above table as well as in the summary in the form of cumulative percentages which follows the wide variations in earnings in the different districts are clearly shown. The comparison of different districts, however, should not be too closely drawn in this depart-

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ment on account of the very widely diversified group of occupations and employees which it covers.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: MISCELLANEOUS.

Districts.	Normal number of employees.	Per cent of employees earning per hour—							
		Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	26	.....	26.92	46.15	50.00	92.31	96.15	96.15	100.00
Eastern	425	19.76	28.94	92.00	96.24	98.82	99.29	100.00	100.00
Pittsburgh	1,163	9.37	33.71	50.30	78.25	94.15	97.59	99.57	100.00
Great Lakes and Middle West	879	1.37	17.75	73.38	85.78	92.38	99.43	99.89	100.00
Southern	68	27.94	92.65	97.06	100.00	100.00	100.00	100.00	100.00
Total	2,561	8.75	28.93	66.34	84.11	94.46	98.56	99.73	100.00

CUSTOMARY WORKING HOURS PER WEEK.

Data relative to the customary working hours were reported for 2,561 employees in the miscellaneous department, which includes, as has been noted above, chiefly watchmen, gatemen, and others whose duties are of a similar nature. Practically three-fourths of the employees in this department were working 72 hours and over per week, and 43.81 per cent were working 84 hours and over per week. The latter group, of course, is made up largely of the watchmen and others whose duties are of a similar character.

The table which follows shows for each district the number and per cent of employees working each classified number of hours per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: MISCELLANEOUS.

NUMBER.

Districts.	Normal number of employees.	Employees whose customary working hours per week were—								
		48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	26	.....	.....	.....	4	1	.....	.....	19	2
Eastern	425	.....	3	12	7	42	254	6	94	7
Pittsburgh	1,163	20	7	25	77	61	57	209	692	15
Great Lakes and Middle West	879	.....	23	46	28	227	285	6	248	16
Southern	68	.....	.....	.....	36	3	.....	.....	29	.....
Total	2,561	20	33	83	152	334	596	221	1,082	40

PER CENT.

New England	26	.....	.....	.....	15.38	3.85	.....	.....	73.08	7.69
Eastern	425	.....	0.71	2.82	1.65	9.88	59.76	1.41	22.12	1.65
Pittsburgh	1,163	1.72	.60	2.15	6.62	5.25	4.90	17.97	59.50	1.29
Great Lakes and Middle West	879	.....	2.62	5.23	3.19	25.82	32.42	.68	28.21	1.82
Southern	68	.....	.....	.....	52.94	4.41	.....	.....	42.65	.....
Total	2,561	.78	1.29	3.24	5.94	13.04	23.27	8.63	42.25	1.56

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DAYS WORKED PER WEEK.

Of the 2,561 employees in the miscellaneous department, 51.11 per cent were reported as working 7 days or turns per week. The reason for this large proportion working 7 days or turns per week will be seen when it is understood that a large number of the employees in this department are watchmen, policemen, and others who must necessarily be on duty when the plant is not in operation.

The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—POWER, MECHANICAL, AND YARD FORCE: MISCELLANEOUS.

Districts.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
		5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	26	1	.....	4	.....	21	3.85	.....	15.38	.....	80.77
Eastern	425	1	8	299	2	115	.24	1.88	70.35	0.47	27.06
Pittsburgh	1,163	5	19	260	10	869	.43	1.63	22.36	.86	74.72
Great Lakes and Middle West	879	2	223	378	4	272	.23	25.37	43.00	.46	30.94
Southern	68	.....	.....	36	.....	32	.....	.....	52.94	.....	47.06
Total	2,561	9	250	977	16	1,309	.35	9.76	38.15	.62	51.11

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CHAPTER III.

EARNINGS, HOURS OF LABOR, AND DAYS WORKED IN STEEL FOUNDRIES, BY OCCUPATIONS.

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CHAPTER III.

EARNINGS, HOURS OF LABOR, AND DAYS WORKED IN STEEL FOUNDRIES, BY OCCUPATIONS.

INTRODUCTION.

In this chapter are presented the data as to the earnings and the hours and days of work prevailing in the steel foundries in the month of May, 1910. The data are presented separately for the following reasons:

1. The steel foundries are practically all separate plants and not identified in any way with steelworks and rolling mills.

2. The conditions as regards working hours are entirely different, because the work in the steel foundries is not necessarily continuous day and night.

3. The data presented were not nearly so satisfactory as for the blast furnaces and steelworks and rolling mills, because reports were secured from a smaller proportion of plants in the case of steel foundries and because there are a large number of pieceworkers in the steel foundries for whom individual records as to the earnings were not secured, the data reported referring to the earnings of groups of men in the particular occupation only. The few tests which it has been possible to apply to the earnings of these pieceworkers indicate that the facts reported would not be greatly changed if individual records for each employee had been obtained.

The steel foundries differ from the ordinary iron foundry chiefly in the difference in the nature and source of the molten metal used and in the fact that greater care must be exercised in the production of steel castings than is necessary for ordinary iron castings, and for this reason a higher grade of molders must be employed. The steel used in making steel castings is produced either in small open-hearth furnaces, usually of less than 25 tons capacity, or in small converters, similar in general principle to though differing in construction from the standard Bessemer converter, or, in a very few cases, by crucible furnaces. In the discussion of occupations in steel foundries little attention is given to the employees connected with the production of steel, since the conditions for these employees have been fully covered in the discussion of open-hearth and crucible furnaces and Bessemer converters.

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The steel foundries are much more widely and uniformly distributed throughout the country than is the case with the steelworks and rolling mills. This arises largely from the fact that it is highly desirable to have the steel foundries located in the neighborhood of the large manufacturing towns in all parts of the country so that castings can be secured with as little delay as possible. Furthermore, the economies of large production and those economies arising from taking the molten metal direct from the blast furnaces play little part in the successful operation of the steel foundries. One of the principal results of the wide and uniform distribution of the steel foundries and the consequent ease of movement from one plant to another of the highly skilled men has been the standardization of wages for this class of employees throughout the country to a degree that does not exist in the case of steelworks and rolling mills.

SUMMARY OF EARNINGS AND HOURS AND DAYS OF WORK.

EARNINGS.

Data relative to earnings were reported for 26,983 employees in 90 steel foundries. Of the employees 25,886, or 95.93 per cent, were in the productive occupations and only 1,097 were in the nonproductive occupations. This situation it may be noted is entirely different from that found in the steelworks and rolling mills, where the nonproductive force was almost as large as the productive force. This arises from the fact that steel foundries are not large plants and, consequently, are not capable of being organized to the same degree as the large steelworks and rolling mills. In the steel foundries, therefore, many of the men in the productive occupations also perform various minor duties which in the large and highly organized plants would be delegated to special employees who would be classed as in nonproductive occupations. Furthermore, in the steel foundries there is little machinery requiring a large repair force, and the handling of the materials and products does not require the maintenance of a separate industrial railway system as in the case of the large steelworks and rolling mills.

Of the 26,983 employees included in this report on steel foundries, 22.56 per cent earned 16 and under 18 cents per hour; 18.23 per cent earned 30 and under 40 cents per hour, and 17.78 per cent earned 20 and under 25 cents per hour. In the productive occupations, which include more than 95 per cent of the employees, practically the same proportions are found to exist, but in the nonproductive occupations it will be seen that the largest group, including 34 per cent of employees, earned 20 and under 25 cents per hour; the next group in order of size, including 18.60 per cent, earned 30 and under 40 cents per hour, and the third large group, including 17.05 per cent, earned

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25 and under 30 cents per hour. This group in the nonproductive occupations consisted in large part of the various repair men and their helpers.

Of the employees in the steel foundries included in this report 55.39 per cent were in the Great Lakes and Middle West district. The employees in the Eastern and the Pittsburgh districts were about equal in number, each of those districts including approximately one-fifth of all employees reported. The New England district is the only other district in which the number of employees reported is sufficiently large to warrant its use for comparative purposes. The data presented for the Southern district, however, cover the facts for more than one plant and, consequently, are of some significance.

The table which follows shows the per cent of the employees in each district earning each classified amount per hour. The data are shown separately for both the productive and the nonproductive occupations, as well as for "all occupations," under which head the employees in the productive and the nonproductive occupations are combined.

PER CENT OF EMPLOYEES EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—STEEL FOUNDRIES.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Per cent of employees earning each classified amount per hour—								
			Under 14 cents.	14 and under 16 cents.	16 and under 18 cents.	18 and under 20 cents.	20 and under 25 cents.	25 and under 30 cents.	30 and under 40 cents.	40 and under 50 cents.	50 cents and over.
PRODUCTIVE OCCUPATIONS.											
New England	3	567	0.71	.....	21.34	23.10	21.34	8.11	21.87	3.35	0.18
Eastern	21	5,341	13.48	15.69	14.75	7.51	16.68	13.44	13.44	3.82	1.18
Pittsburgh	17	5,279	1.40	9.34	28.64	13.51	18.70	6.46	19.66	2.01	.28
Great Lakes and Middle West	45	14,361	.64	10.07	24.63	12.66	16.76	13.06	19.29	2.74	.15
Southern	3	226	7.52	28.32	2.21	24.34	4.42	2.21	22.57	5.75	2.65
Total, all districts	90	25,886	3.50	10.98	23.04	12.05	17.09	11.81	18.21	2.91	.41
NONPRODUCTIVE OCCUPATIONS.											
Eastern	17	209	7.18	20.57	7.66	6.70	32.54	10.53	9.09	1.91	3.83
Pittsburgh	14	247	2.83	4.05	12.96	11.74	23.89	17.41	25.10	1.62	.40
Great Lakes and Middle West	30	585	.85	1.20	11.28	5.98	40.85	19.66	19.15	.51	.51
Total, all districts	64	1,097	2.73	5.92	11.12	8.30	34.00	17.05	18.60	1.09	1.19
ALL OCCUPATIONS.											
New England	3	610	1.15	.....	20.82	23.61	20.49	8.52	21.97	3.11	.33
Eastern	21	5,550	13.24	15.87	14.49	7.48	17.28	13.33	13.28	3.75	1.28
Pittsburgh	17	5,526	1.47	9.10	27.94	13.43	18.93	6.95	19.91	1.99	.29
Great Lakes and Middle West	45	14,946	.65	9.72	24.11	12.40	17.70	13.31	19.28	2.66	.17
Southern	3	236	7.20	29.24	2.97	23.31	5.51	2.12	21.61	5.51	2.54
Total, all districts	90	26,983	3.47	10.77	22.56	11.89	17.78	12.02	18.23	2.83	.44

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A comparison of the earnings in the different districts, however, can be made more easily from the summary in the form of cumulative percentages which follows. In this table the employees in the productive and the nonproductive occupations are combined. Comparing the three principal districts, it will be seen that the proportion of employees earning 30 cents or more per hour is nearly the same, the slight difference that exists being in the Eastern district, which shows a somewhat smaller proportion earning 30 cents or more per hour than either of the other two districts. Again comparing the same districts, there is seen a wide difference as regards the proportion reported as earning less than 16 cents per hour. In the Eastern district 29.12 per cent of the employees earned less than 16 cents per hour, while in the Pittsburgh and the Great Lakes and Middle West districts the proportions were 10.57 and 10.37, respectively. This wide difference results from the fact that in the Eastern district the standard rate for unskilled labor is less than 16 cents and in many cases less than 14 cents per hour, while in the Pittsburgh and the Great Lakes and Middle West districts the majority of the unskilled employees are paid more than 16 cents per hour, only a relatively small proportion earning less than 14 cents.

PER CENT OF EMPLOYEES EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—STEEL FOUNDRIES.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Per cent of employees earning per hour—							
			Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	3	610	1.15	1.15	21.97	45.57	66.07	74.59	96.56	99.67
Eastern	21	5,550	13.24	29.12	43.60	51.08	68.36	81.69	94.97	98.72
Pittsburgh	17	5,526	1.47	10.57	38.51	51.94	70.86	77.81	97.72	99.71
Great Lakes and Middle West	45	14,946	.65	10.37	34.48	46.88	64.58	77.89	97.18	99.83
Southern	3	236	7.20	36.44	39.41	62.71	68.22	70.34	91.95	97.46
Total, all districts	90	26,983	3.47	14.24	36.80	48.69	66.47	78.49	96.72	99.56

HOURS OF LABOR.

The customary working hours per week for 56.58 per cent of the 26,893 employees in the steel foundries were less than 60 hours per week; approximately one-fourth, 25.94 per cent, customarily worked 60 hours per week, and only 17.49 per cent were reported as working more than 60 hours per week. To sum up the situation as regards the customary working hours in the steel foundries in an approximately accurate way, it may be said that the total daily working time for the majority of employees in steel foundries was either 9 or 10 hours. This situation is strikingly different from

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that found to exist in connection with the steel works and rolling mills, where the majority of the employees were found to be working 12 hours per day and at least 72 hours per week.

The classified customary working hours per week in the productive and the nonproductive occupations as well as in all occupations are shown in the following summary:

PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—STEEL FOUNDRIES.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Per cent of employees whose customary working hours per week were—			
			Under 56.	56 and under 60.	60.	Over 60.
PRODUCTIVE OCCUPATIONS.						
New England	3	567	95.94	3.70	0.18	0.18
Eastern	21	5,341	43.66	30.48	12.39	13.46
Pittsburgh	17	5,279	52.23	11.18	20.17	16.42
Great Lakes and Middle West	45	14,361	35.55	10.71	34.25	19.49
Southern	3	226	63.72	.....	26.11	10.18
Total, all districts	90	25,886	42.47	14.59	25.90	17.03
NONPRODUCTIVE OCCUPATIONS.						
Eastern	17	209	24.88	28.22	8.13	38.76
Pittsburgh	14	247	48.58	9.31	13.77	28.34
Great Lakes and Middle West	30	565	29.23	3.59	41.20	25.98
Total, all districts	64	1,097	35.37	9.66	26.80	28.17
ALL OCCUPATIONS.						
New England	3	610	95.25	3.93	.16	.65
Eastern	21	5,550	42.95	30.40	12.23	14.41
Pittsburgh	17	5,526	52.06	11.09	19.89	16.96
Great Lakes and Middle West	45	14,946	35.31	10.43	34.52	19.74
Southern	3	236	63.14	.....	25.85	11.02
Total, all districts	90	26,963	42.19	14.39	25.94	17.49

The conditions as regards the hours of work in the nonproductive occupations were somewhat different from those found to exist for the employees in the productive occupations. A somewhat smaller percentage of those in the nonproductive occupations were reported as working less than 60 hours per week, and a much larger percentage were reported as working over 60 hours per week. The conditions existing in the different districts as regards the hours of labor were widely different. In the New England district, for example, 95.25 per cent of the employees were reported as working less than 56 hours per week, while in the Great Lakes and Middle West district only 35.31 per cent were reported as working less than 56 hours per week. The Eastern district is peculiar in the fact that almost one-third of the employees were reported as working 56 and less than 60 hours per week. In the three principal districts the proportions of employees reported as working over 60 hours per week were nearly the same.

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DAYS PER WEEK.

Six days or turns per week was the customary working time for 93.95 per cent of the employees in steel foundries. Only 2.93 per cent of the employees were reported as working 7 days or turns per week. The small proportion shown as working 5 days per week were men employed on the night shift in foundries operating 6 days and 5 nights per week. In these cases the men on the night shift did not change shifts with the corresponding employees on the day shift but worked nights throughout the year. In the nonproductive occupations, however, a considerable number of employees, 16.50 per cent, were reported as working 7 days or turns per week. This group of employees includes chiefly the stationary firemen and others who are necessarily on duty when the mill is not operated.

The table which follows shows for the employees in the productive and the nonproductive occupations the per cent customarily working each specified number of days or turns per week. Under the head of "All occupations" the data for the employees in the productive and the nonproductive occupations are combined.

PER CENT OF EMPLOYEES CUSTOMARILY WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—STEEL FOUNDRIES.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
PRODUCTIVE OCCUPATIONS.							
New England	3	567	.....	.....	100.00	.....	.....
Eastern	21	5,341	1.70	9.34	85.94	.....	3.01
Pittsburgh	17	5,279	1.55	.....	96.08	0.15	2.22
Great Lakes and Middle West	45	14,361	1.00	.....	96.70	.....	2.30
Southern	3	226	.....	.....	100.00	.....	.....
Total, all districts	90	25,886	1.22	1.93	94.47	.03	2.35
NONPRODUCTIVE OCCUPATIONS.							
Eastern	17	209	.96	.....	[1] 71.77	1.91	25.36
Pittsburgh	14	247	2.43	.....	75.71	3.24	18.62
Great Lakes and Middle West	30	585	.....	.....	87.01	.....	12.99
Total, all districts	64	1,097	.73	.....	[1] 81.68	1.09	16.50
ALL OCCUPATIONS.							
New England	3	610	.....	.....	99.02	.....	.98
Eastern	21	5,550	1.68	8.99	[1] 85.41	.07	3.86
Pittsburgh	17	5,526	1.59	.....	95.17	.29	2.95
Great Lakes and Middle West	45	14,946	.96	.....	96.32	.....	2.72
Southern	3	236	.....	.....	100.00	.....	.....
Total, all districts	90	26,983	1.20	1.85	[1] 93.95	.07	2.93

[1] Including 2 employees whose customary working time per week was 5 and 7 days alternately.

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EARNINGS AND HOURS AND DAYS OF WORK, BY OCCUPATIONS.

EARNINGS PER HOUR.

In this section are presented data relative to the earnings in the principal occupations in steel foundries. These principal occupations, which are 10 in number, include approximately 22,000 of the 26,983 employees in steel foundries. The occupation data for steel foundries are not quite so satisfactory as in the steelworks and rolling mills, owing chiefly to the lack of a clear distinction between such occupations as molders and the helpers who assisted in the operation of the molding. This lack of a clear distinction is almost inevitable where the work is of so many different grades as is the case in the steel foundries. Any division that might be made would be at best only arbitrary. The data which is presented in the following table, however, are believed to represent accurately the earnings of the employees in the occupations specified.

The table which follows shows for each principal occupation the number and per cent of employees earning each classified amount per hour. The occupations are in order following the processes of manufacture.

NUMBER AND PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS EARNING EACH CLASSIFIED AMOUNT PER HOUR—STEEL FOUNDRIES.

NUMBER.

Occupations.	Number of plants.	Number of employees.	Employees earning each classified amount per hour.											
			Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Pattern makers	47	524	.....	.....	.....	.....	1	51	92	250	120	9	1	.....
Core makers	77	1,300	9	16	15	47	44	262	358	537	10	2	.....	.....
Core makers' helpers	31	438	20	18	146	162	47	18	27	.....	.....	.....	.....	.....
Molders, steel	90	4,878	.....	.....	3	79	61	394	979	2,870	425	5	61	1
Molders' helpers, steel	60	2,890	20	240	271	1,048	618	559	84	50	.....	.....	.....	.....
Chippers	72	4,239	1	27	169	1,060	987	973	512	452	58	.....	.....	.....
Grinders	38	550	.....	9	43	174	114	156	53	1	.....	.....	.....	.....
Machine hands	39	1,044	.....	3	30	60	127	371	259	101	93	.....	.....	.....
Cranemen	53	728	9	8	13	59	30	310	210	88	.....	.....	.....	1
Laborers	79	5,434	9	236	1,773	2,537	590	258	31	.....	.....	.....	.....	.....
All other productive occupations	90	3,861	201	81	378	739	499	1,072	452	366	46	20	4	3
Nonproductive occupations	64	1,097	6	24	65	122	91	373	187	204	12	8	5	.....
Total	90	26,983	275	662	2,906	6,087	3,209	4,797	3,244	4,919	764	44	71	5

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NUMBER AND PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS EARNING EACH CLASSIFIED AMOUNT PER HOUR—STEEL FOUNDRIES—Concluded.

PER CENT.

Occupations.	Number of plants.	Number of employees.	Employees earning each classified amount per hour.											
			Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Pattern makers	47	524	.....	.....	.....	.....	0.19	9.73	17.56	47.71	22.90	1.72	0.19	.....
Core makers	77	1,300	0.69	1.23	1.15	3.62	3.38	20.15	27.54	41.31	.77	.15	.....	.....
Core makers' helpers	31	438	4.57	4.11	33.33	36.99	10.73	4.11	6.16	.....	.....	.....	.....	.....
Molders, steel	90	4,878	.....	.....	.06	1.62	1.25	8.08	20.07	58.84	8.71	.10	1.25	0.02
Molders' helpers, steel	60	2,890	.69	8.30	9.38	36.26	21.38	19.34	2.91	1.73	.....	.....	.....	.....
Chippers	72	4,239	.02	.64	3.99	25.01	23.28	22.95	12.08	10.66	1.37	.....	.....	.....
Grinders	38	550	.....	1.64	7.82	31.64	20.73	28.36	9.64	.18	.....	.....	.....	.....
Machine hands	39	1,044	.....	.29	2.87	5.75	12.16	35.54	24.81	9.67	8.91	.....	.....	.....
Cranemen	53	728	1.24	1.10	1.79	8.10	4.12	42.58	28.85	12.09	.....	.....	.....	.14
Laborers	79	5,434	.17	4.34	32.63	46.69	10.86	4.75	.57	.....	.....	.....	.....	.....
All other productive occupations	90	3,861	5.21	2.10	9.79	19.14	12.92	27.76	11.71	9.48	1.19	.52	.10	.08
Nonproductive occupations	64	1,097	.55	2.19	5.93	11.12	8.30	34.00	17.05	18.60	1.09	.73	.46	.....
Total	90	26,983	1.02	2.45	10.77	22.56	11.89	17.78	12.02	18.23	2.83	.16	.26	.02

In steel founding, as in all other branches of the steel industry, the unskilled laborers constituted the largest number of persons engaged in a single occupation. Of the 5,434 laborers, 4,310, or 79.32 per cent, earned 14 and less than 18 cents per hour. A considerable number, 16.18 per cent, earned 18 cents or more per hour. This proportion reported as earning 18 cents or more per hour is considerably larger than was reported in the steelworks and rolling mills. This arises largely out of the fact that the working-day is shorter in the steel foundries than in the steelworks and rolling mills, and in order to secure competent laborers it is necessary to pay them approximately the same daily wages as in the steelworks and rolling mills. This results in a considerably higher rate of hourly earnings.

The second occupation as regards number was that of the steel molders, of whom there were 4,878. More than three-fourths, 78.91 per cent, of the molders earned 25 and under 40 cents per hour; 10.09 per cent earned 40 cents or more per hour, and 11.01 per cent earned less than 25 cents per hour. It is highly probable that the molders reported as earning less than 20 cents per hour were either apprentices or helpers. The difficulty in drawing a line between these two classes of employees lies in the fact that in some establishments the work is subdivided so that the helpers are performing a part of the work formerly done by the molders and through custom they have come to be known as molders although the skill which they possess and the general character of the work done by them does not entitle them to be so classified. Because of this slight overlapping in the classification it is highly desirable that the facts relative to the earnings for molders' helpers should be considered in connection with

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those for molders. The occupation of molders' helpers included 2,890. The majority of the molders' helpers, 57.65 per cent, earned 16 and less than 20 cents per hour. A considerable proportion, however, 23.98 per cent, earned 20 cents or more per hour. A slightly smaller group including 18.37 per cent earned less than 16 cents per hour.

The occupation of chippers, including 4,239 employees, requires widely varying degrees of skill, according as the castings are simple or complex, and consequently a wide range of earnings in this occupation is reported. The wide variation of earnings in this occupation is also largely influenced by the fact that every grade of it is done on a piecework or bonus system, under which the individual by his own exertion can secure considerably higher earnings than the less skillful and energetic workman on the same general class of the product. Of the chippers 71.24 per cent were reported as earning 16 and less than 25 cents per hour. The grinders, who finish the product after the most considerable defects have been removed by the chippers, are reported as being paid very much the same wages as the chippers. Of the pattern makers, 90.08 per cent were reported as earning 25 cents or more per hour. All of the pattern makers are highly skilled workmen, because this work requires a great deal of experience as well as manual dexterity The degree of skill possessed by pattern makers, however, varies considerably, as is indicated by the wide differences in the amount of earnings reported. Approximately one-fourth, 24.81 per cent, of the pattern makers were reported as earning 40 cents or more per hour. The earnings of the core makers vary widely, according to the difficulty of the particular work for which they are employed. The making of cores as for simple cylindrical castings is easy and can be quickly learned, while the preparation of the cores for intricate castings is a matter which requires not only a long period of training but also considerable knowledge of the action of molten metal. Core makers' helpers are for the most part unskilled employees, as is indicated by the fact that 79 per cent of them earned less than 18 cents per hour. The occupation designated as machine hands includes employees of widely different degrees of skill. This classification was made necessary by the fact that the data for the employees in the finishing department were not clearly defined in the reports of the companies, and it was therefore necessary to bring together in this particular group the machinists, handy men, drillers, and other similar employees whose duties are ordinarily quite clearly defined and who are also of very different grades of skill and experience. Few highly skilled machinists, however, are included in this group, as is indicated by the fact that only 8.91 per cent were reported as earning 40 cents or more per hour. Of the cranemen, 83.65 per cent were reported as earning 20 cents or more per hour. All but 1 of the cranemen, however, earned less than 40 cents per hour.

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CUSTOMARY WORKING HOURS PER WEEK.

The customary working time per week in steel foundries was shortest for the employees in the highly skilled occupations, which are pattern makers, steel molders, and steel molders' helpers, who necessarily work the same length of time as the molder. Between 61 and 66 per cent of the employees in each of these three occupations were reported as working over 48 and under 56 hours per week. The occupations of core makers and chippers show considerable proportions as working 48 hours or less per week. In only two of the occupations—cranemen and laborers—were any considerable number of the employees reported as working 72 hours or more per week. Apparently, the wide variation between the customary working time for core makers and core makers' helpers arises from the fact that in many of the establishments which showed working hours of less than 56 hours per week there was another separate class of core makers' helpers.

The table which follows shows for each principal occupation the number and percentage of employees customarily working each classified number of hours per week. The occupations are in order following the processes of manufacture.

NUMBER AND PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK—STEEL FOUNDRIES.

NUMBER.

Occupations.	Number of plants.	Normal number of employees.	Employees whose customary working hours per week were—								
			48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Pattern makers	47	524	.....	333	95	81	15	.....	.....	.....	.....
Core makers	77	1,300	125	581	159	323	69	31	12	.....	.....
Core makers' helpers	31	438	.....	133	37	173	83	12	.....	.....	.....
Molders, steel	90	4,878	90	3,002	553	1,083	98	38	11	.....	3
Molders' helpers, steel	60	2,890	34	1,905	324	521	59	28	13	.....	6
Chippers	72	4,239	370	1,066	980	1,459	211	124	8	.....	21
Grinders	38	550	.....	312	39	134	42	20	.....	.....	3
Machine hands	39	1,044	3	449	180	187	166	41	14	.....	4
Cranemen	53	728	2	134	62	245	99	141	41	4	.....
Laborers	79	5,434	.....	1,308	960	1,641	621	572	224	46	62
All other productive occupations	90	3,861	60	1,088	388	858	601	604	114	142	6
Nonproductive occupations	64	1,097	4	384	106	294	56	85	31	128	9
Total	90	26,983	688	10,695	3,883	6,999	2,120	1,696	468	320	114

PER CENT.

Pattern makers	47	524	.....	63.55	18.13	15.46	2.86	.....	.....	.....	.....
Core makers	77	1,300	9.62	44.69	12.23	24.85	5.31	2.38	0.92	.....	.....
Core makers' helpers	31	438	.....	30.37	8.45	39.50	18.95	2.74	.....	.....	.....
Molders, steel	90	4,878	1.85	61.54	11.34	22.20	2.01	.78	.23	.....	0.06
Molders' helpers, steel	60	2,890	1.18	65.92	11.21	18.03	2.04	.97	.45	.....	.21
Chippers	72	4,239	8.73	25.15	23.12	34.42	4.98	2.93	.19	.....	.50
Grinders	38	550	.....	56.73	7.09	24.36	7.64	3.64	.....	.....	.55
Machine hands	39	1,044	.29	43.01	17.24	17.91	15.90	3.93	1.34	.....	.38
Cranemen	53	728	.27	18.41	8.52	33.65	13.60	19.37	5.63	0.55	.....
Laborers	79	5,434	.....	24.07	17.67	30.20	11.43	10.53	4.12	.85	1.14
All other productive occupations	90	3,861	1.55	28.18	10.05	22.22	15.57	15.64	2.95	3.68	.16
Nonproductive occupations	1,0[illegible]1	1,097	.36	35.00	9.66	26.80	5.10	7.75	2.83	11.67	.82
Total	90	26,983	2.55	39.64	14.39	25.94	7.86	6.29	1.73	1.19	.42

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DAYS WORKED PER WEEK.

The chief reason for entering into a discussion of the number of days or turns worked per week in the various occupations is to determine in what occupation the employees reported as working 7 days or turns per week may be. An examination of the table which follows shows that the employees working 7 days or turns per week were for the most part machine hands or laborers or were in the nonproductive occupations. Considerable proportions, however, were in the various miscellaneous occupations which go to make up the group classified in the table as all other productive occupations.

The following table shows for each principal occupation the number and per cent of employees customarily working each specified number of days or turns per week. The occupations are in order following the processes of manufacture:

NUMBER AND PER CENT OF EMPLOYEES IN EACH OF THE PRINCIPAL OCCUPATIONS WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK—STEEL FOUNDRIES.

NUMBER.

Occupations.	Number of plants.	Normal number of employees.	Employees whose customary time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Pattern makers	47	524	.....	.....	524	.....	.....
Core makers	77	1,300	.....	24	1,276	.....	.....
Core makers' helpers	31	438	.....	.....	438	.....	.....
Molders, steel	90	4,878	91	52	4,733	.....	2
Molders' helpers, steel	60	2,890	25	.....	2,844	.....	21
Chippers	72	4,239	46	.....	4,152	.....	41
Grinders	38	550	.....	.....	546	.....	4
Machine hands	39	1,044	15	92	887	.....	50
Cranemen	53	728	11	.....	696	8	13
Laborers	79	5,434	71	311	4,792	.....	260
All other productive occupations	90	3,861	57	20	3,566	.....	218
Nonproductive occupations	64	1,097	8	.....	[1] 896	12	181
Total	90	26,983	324	499	[1] 25,350	20	790

PER CENT.

Pattern makers	47	524	.....	.....	100.00	.....	.....
Core makers	77	1,300	.....	1.85	98.15	.....	.....
Core makers' helpers	31	438	.....	.....	100.00	.....	.....
Molders, steel	90	4,878	1.87	1.07	97.03	.....	0.04
Molders' helpers, steel	60	2,890	.87	.....	98.41	.....	.73
Chippers	72	4,239	1.09	.....	97.95	.....	.97
Grinders	38	550	.....	.....	99.27	.....	.73
Machine hands	39	1,044	1.44	8.81	84.96	.....	4.79
Cranemen	53	728	1.51	.....	95.60	1.10	1.79
Laborers	79	5,424	1.31	5.72	88.19	.....	4.78
All other productive occupations	90	3,861	1.48	.52	92.36	.....	5.65
Nonproductive occupations	64	1,097	.73	.....	[1] 81.68	1.09	16.50
Total	90	26,983	1.20	1.85	[1] 93.95	.07	2.93

[1] Including 2 employees whose customary working time per week was 5 and 7 days alternately.

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EARNINGS AND HOURS AND DAYS OF WORK, BY DISTRICTS.

PRODUCTIVE OCCUPATIONS.

EARNINGS.

The employees in the productive occupations include 25,886 of the 26,983 employees reported as working in steel foundries. A large number of these employees (4,635) were paid either on a tonnage or piecework basis. As the majority of the employees paid in this manner were skilled workmen, it is important that the data should be shown separately for the employees paid on a time and on a tonnage or piecework basis. This separation is made in the table which follows and shows for each district the number of employees earning each classified amount per hour.

NUMBER OF EMPLOYEES IN PRODUCTIVE OCCUPATIONS EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—STEEL FOUNDRIES.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Number of employees earning each classified amount per hour.											
			Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
TIME WORKERS.														
New England	3	430	3	1	.....	97	131	97	22	76	2	1	.....	.....
Eastern	21	4,405	169	531	819	748	218	791	657	447	20	4	1	.....
Pittsburgh	17	4,630	45	23	447	1,414	661	752	258	913	102	12	2	1
Great Lakes and Middle West	45	11,448	38	43	1,436	3,497	1,625	1,746	1,124	1,711	211	12	2	3
Southern	3	226	2	15	64	5	55	10	5	51	13	6	.....	.....
Total, all districts	90	21,251	257	613	2,766	5,763	2,690	3,404	2,138	3,212	364	35	5	4
TONNAGE WORKERS.														
Eastern	11	936	4	16	19	40	183	100	61	271	184	1	57	.....
Pittsburgh	6	649	....	6	46	98	52	235	83	125	4	.....	.....	.....
Great Lakes and Middle West	18	2,913	8	3	10	40	193	661	751	1,059	183	.....	4	1
Total, all districts	36	4,635	12	25	75	202	428	1,020	919	1,503	388	1	61	1
TIME AND TONNAGE WORKERS.														
New England	3	567	3	1	.....	121	131	121	46	124	19	1	.....	.....
Eastern	21	5,341	173	547	838	788	401	891	718	718	204	5	58	.....
Pittsburgh	17	5,279	45	29	493	1,512	713	987	341	1,038	106	12	2	1
Great Lakes and Middle West	45	14,361	46	46	1,446	3,537	1,818	2,407	1,875	2,770	394	12	6	4
Southern	3	226	2	15	64	5	55	10	5	51	13	6	.....	.....
Total, all districts	90	25,880	269	638	2,841	5,965	3,118	4,424	3,057	4,715	752	36	66	5

It will be seen from the above table that 2,873 of the 4,635 tonnage workers, or 61.98 per cent, earned 25 cents or more per hour. This is in decided contrast to the earnings of time workers, where 5,758, or 27.10 per cent of the entire number of time workers,

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were reported as earning 25 cents or more per hour. This marked difference between the earnings of time workers and tonnage workers, however, is due almost altogether to the fact that only the employees in the more skilled occupations are paid on a piecework or tonnage basis, while the time workers include all the laborers and other unskilled workers. It is true, nevertheless, that in the occupations where both time workers and tonnage workers were reported, the tonnage workers as a rule earned somewhat greater amounts per hour. Practically all of those reported as earning less than 12 cents per hour, of whom there were 269, were boys or, in the very few cases, women employed in the core-making department. Only 5 employees were reported as earning 70 cents or more per hour. This is in decided contrast to the situation in the rolling mills, where a considerable number of the more highly skilled employees were paid more than 70 cents per hour. For the employees as a whole, however, the hourly earnings in steel foundries were very much the same as in the rolling mills.

The table which follows shows for each district the per cent of employees earning each classified amount per hour. In this table time workers and tonnage workers are combined, the percentages being computed from the third section of the table immediately preceding.

PER CENT OF EMPLOYEES IN PRODUCTIVE OCCUPATIONS EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—STEEL FOUNDRIES.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Per cent of employees earning each classified amount per hour.											
			Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
New England	3	567	0.53	0.18	....	21.34	23.10	21.34	8.11	21.87	3.35	0.18	....	.....
Eastern	21	5,341	3.24	10.24	15.69	14.75	7.51	16.68	13.44	13.44	3.82	.09	1.09	....
Pittsburgh	17	5,279	.85	.55	9.34	28.64	13.51	18.70	6.46	19.66	2.01	.23	.04	0.02
Great Lakes and Middle West	45	14,361	.32	.32	10.07	24.63	12.66	16.76	13.06	19.29	2.74	.08	.04	.03
Southern	3	226	.89	6.64	28.32	2.21	24.34	4.42	2.21	22.57	5.75	2.65	.....	.....
Total, all districts	90	25,886	1.04	2.46	10.98	23.04	12.05	17.09	11.81	18.21	2.91	.14	.26	.02

The data shown in the above table will be more easily understood by a comparison of it with the summary in the form of cumulative percentages which follows. It will be seen from this summary that 37.52 per cent of the employees earned less than 18 cents per hour and that 66.66 per cent earned less than 25 cents per hour. Only 3.32 per cent of all the employees in steel foundries earned as much as 40 cents per hour.

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PER CENT OF EMPLOYEES IN PRODUCTIVE OCCUPATIONS EARNING LESS THAN SPECIFIED AMOUNT PER HOUR—STEEL FOUNDRIES.

Earnings per hour.	Number of employees.	Per cent of total number of employees.	Earnings per hour.	Number of employees.	Per cent of total number of employees.
Under 14 cents	907	3.50	Under 25 cents	17,255	66.66
Under 16 cents	3,748	14.48	Under 30 cents	20,312	78.47
Under 18 cents	9,713	37.52	Under 40 cents	25,027	96.68
Under 20 cents	12,831	49.57	Under 50 cents	25,779	99.59

The per cent of employees earning less than each specified amount per hour for each district is shown by means of cumulative percentages in the table which follows:

PER CENT OF EMPLOYEES IN PRODUCTIVE OCCUPATIONS EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—STEEL FOUNDRIES.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Per cent of employees earning each classified amount per hour.							
			Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
New England	3	567	0.71	0.71	22.05	45.15	66.49	74.60	96.47	99.82
Eastern	21	5,341	13.48	29.17	43.92	51.43	68.11	81.56	95.00	98.82
Pittsburgh	17	5,279	1.40	10.74	39.38	52.89	71.59	78.05	97.71	99.72
Great Lakes and Middle West	45	14,361	.64	10.71	35.34	48.00	64.76	77.81	97.10	99.85
Southern	3	226	7.52	35.84	38.05	62.39	66.81	69.03	91.59	97.35
Total, all districts	90	25,886	3.50	14.48	37.52	49.57	66.66	78.47	96.68	99.59

The above comparison shows that the earnings were under 16 cents per hour for 29.17 per cent of the employees in the Eastern district as contrasted with only 10.74 per cent earning less than 16 cents per hour in the Pittsburgh district and only 10.71 per cent in the Great Lakes and Middle West district. Approximately one-half of the employees, however, in each of the three principal districts earned less than 20 cents per hour, and in each group of earnings above 20 cents per hour the proportion shown for each of the three principal districts was nearly the same. This means essentially that the most considerable difference between the different districts is to be found in the earnings of the less highly skilled employees, and more particularly in the earnings of the unskilled laborers.

CUSTOMARY WORKING HOURS PER WEEK.

Of the employees in productive occupations in steel foundries, 82.97 per cent were working 60 hours or less per week. The working hours for the tonnage workers were somewhat shorter than for the time workers, 89.30 per cent of the tonnage workers customarily working 60 hours or less per week as contrasted with 81.59 per cent of the time workers reported as working 60 hours or less per week.

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The table which follows shows for each district the number of employees customarily working each classified number of hours per week. The time workers and tonnage workers are shown separately:

NUMBER OF EMPLOYEES IN PRODUCTIVE OCCUPATIONS CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—STEEL FOUNDRIES.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Number of employees whose customary working hours per week were—								
			48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
TIME WORKERS.											
New England	3	430	.....	407	21	1	.....	.....	1	.....	.....
Eastern	21	4,405	45	1,764	1,401	575	131	189	222	8	70
Pittsburgh	17	4,630	.....	2,750	347	738	462	231	24	77	1
Great Lakes and Middle West	45	11,448	24	3,321	1,363	4,266	1,196	1,020	152	105	1
Southern	3	226	.....	144	.....	59	.....	23	.....	.....	.....
Total, all districts	90	21,251	69	8,498	3,132	5,639	1,789	1,463	399	190	72
TONNAGE WORKERS.											
Eastern	11	936	1	522	227	87	57	4	33	.....	5
Pittsburgh	6	649	.....	7	243	327	3	36	5	.....	28
Great Lakes and Middle West	18	2,913	614	1,147	175	652	215	108	.....	2	.....
Total, all districts	36	4,635	615	1,813	645	1,066	275	148	38	2	33
TIME AND TONNAGE WORKERS.											
New England	3	567	.....	544	21	1	.....	.....	1	.....	.....
Eastern	21	5,341	46	2,286	1,628	662	188	193	255	8	75
Pittsburgh	17	5,279	.....	2,757	590	1,065	465	267	29	77	29
Great Lakes and Middle West	45	14,361	638	4,468	1,538	4,918	1,411	1,128	152	107	1
Southern	3	226	.....	144	.....	59	.....	23	.....	.....	.....
Total all districts	90	25,886	684	10,311	3,777	6,705	2,064	1,611	437	192	105

The three principal districts show considerable differences as regards customary working time for employees in steel foundries. In the Pittsburgh district, for example, 52.23 per cent of the employees were reported as working less than 56 hours per week as compared with 43.66 per cent in the Eastern district and 35.55 per cent in the Great Lakes and Middle West district. In the Eastern district, however, only 25.86 per cent of the employees were reported as customarily working 60 hours or more per week as compared with 36.60 per cent in the Pittsburgh district and 53.74 per cent in the Great Lakes and Middle West district. Less than 10 per cent of the employees in any of the districts were reported as working 72 hours or more per week. This, it may be noted, is in marked contrast to the situation in any of the departments of the steelworks and rolling mills.

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The relations of the different districts as regards customary working time are more clearly shown in the table which follows. This table shows the per cent of employees in each district working each classified number of hours per week. The time workers and tonnage workers are combined, the percentages being computed from the third section of the table immediately preceding.

PER CENT OF EMPLOYEES IN PRODUCTIVE OCCUPATIONS CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—STEEL FOUNDRIES.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Per cent of employees whose customary working hours per week were—								
			48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
New England	3	567	.....	95.94	3.70	0.18	.....	.....	0.18	.....	.....
Eastern	21	5,341	0.86	42.80	30.48	12.39	3.52	3.61	4.77	0.15	1.40
Pittsburgh	17	5,279	.....	52.23	11.18	20.17	8.81	5.06	.55	1.46	.55
Great Lakes and Middle West	45	14,361	4.44	31.11	10.71	34.25	9.83	7.85	1.06	.75	.01
Southern	3	226	.....	63.72	.....	26.11	.....	10.18	.....	.....	.....
Total, all districts	90	25,886	2.64	39.83	14.59	25.90	7.97	6.22	1.69	.74	.41

DAYS WORKED PER WEEK.

Six days or turns per week was almost universally the customary working time in the steel foundries, as 94.47 per cent were reported as working 6 days per week. Only 2.35 per cent of the entire productive force were reported as working 7 days or turns per week.

The table which follows shows for each district the per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES IN PRODUCTIVE OCCUPATIONS WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—STEEL FOUNDRIES.

[Data are not shown separately for districts in which only one plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
New England	3	567	.....	.....	567	.....	.....	.....	.....	100.00	.....	.....
Eastern	21	5,341	91	499	4,590	.....	161	1.70	9.34	85.94	.....	3.01
Pittsburgh	17	5,279	82	.....	5,072	8	117	1.55	.....	96.08	0.15	2.22
Great Lakes and Middle West	45	14,361	143	.....	13,887	.....	331	1.00	.....	96.70	.....	2.30
Southern	3	226	.....	.....	226	.....	.....	.....	.....	100.00	.....	.....
Total, all districts.	90	25,886	316	499	24,454	8	609	1.22	1.93	94.47	.03	2.35

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NONPRODUCTIVE OCCUPATIONS.

EARNINGS.

Data relative to earnings were reported for 1,097 employees in nonproductive occupations in steel foundries. Only 27 of these employees were tonnage workers or pieceworkers, and consequently in the tables which follow no separation of the data for time workers and tonnage workers is shown. The facts for these two classes of employees are shown in detail in Table X, Volume II. It may be noted, however, that there is no difference of any importance between the time workers and tonnage workers as regards either earnings or hours of labor.

The table which follows shows for each district the number and per cent of employees earning each classified amount per hour. In this table the time workers and tonnage workers are combined.

NUMBER AND PER CENT OF EMPLOYEES IN NONPRODUCTIVE OCCUPATIONS EARNING EACH CLASSIFIED AMOUNT PER HOUR, BY DISTRICTS—STEEL FOUNDRIES.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

NUMBER.

Districts.	Number of plants.	Normal number of employees.	Employees earning each classified amount per hour.											
			Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Eastern	17	209	.....	15	43	16	14	68	22	19	4	8	.....	.....
Pittsburgh	14	247	5	2	10	32	29	59	43	62	4	.....	1	.....
Great Lakes and Middle West	30	585	.....	5	7	66	35	239	115	112	3	.....	3	.....
Total, all districts	64	1,097	6	24	65	122	91	373	187	204	12	8	5	.....

PER CENT.

Districts.	Number of plants.	Normal number of employees.	Employees earning each classified amount per hour.											
			Under 12 cts.	12 and under 14 cts.	14 and under 16 cts.	16 and under 18 cts.	18 and under 20 cts.	20 and under 25 cts.	25 and under 30 cts.	30 and under 40 cts.	40 and under 50 cts.	50 and under 60 cts.	60 and under 70 cts.	70 cts. and over.
Eastern	17	209	.....	7.18	20.57	7.66	6.70	32.54	10.53	9.09	1.91	3.83	.....	.....
Pittsburgh	14	247	2.02	.81	4.05	12.96	11.74	23.89	17.41	25.10	1.62	.....	0.40	.....
Great Lakes and Middle West	30	585	.....	.85	1.20	11.28	5.98	40.85	19.66	19.15	.51	.....	.51	.....
Total, all districts	64	1,097	.55	2.19	5.93	11.12	8.30	34.00	17.05	18.60	1.09	.73	.46	.....

Thirty-four per cent of the employees in nonproductive occupations earn 20 and under 25 cents per hour. There was, however, considerable difference between the principal districts as regards the proportion of employees earning this amount. In the Pittsburgh district 23.89 per cent of the employees earned 20 and under 25 cents per hour compared with 32.54 per cent in the Eastern district and 40.85 per cent in the Great Lakes and Middle West district.

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The general situation as regards earnings in nonproductive occupations may more clearly be seen in the summary in the form of cumulative percentages which follows:

NUMBER AND PER CENT OF EMPLOYEES IN NONPRODUCTIVE OCCUPATIONS EARNING LESS THAN SPECIFIED AMOUNT PER HOUR—STEEL FOUNDRIES.

Earnings per hour.	Number of employees.	Per cent of total number of employees.	Earnings per hour.	Number of employees.	Per cent of total number of employees.
Under 14 cents	30	2.73	Under 25 cents	681	62.08
Under 16 cents	95	8.66	Under 30 cents	868	79.12
Under 18 cents	217	19.78	Under 40 cents	1,072	97.72
Under 20 cents	308	28.08	Under 50 cents	1,084	98.82

It will be seen from the above table that approximately one-fifth (19.78 per cent) of the employees in nonproductive occupations earned less than 18 cents per hour, and that 62.08 per cent earned less than 25 cents per hour. Only 2.28 per cent of the employees in nonproductive occupations earned as much as 40 cents per hour. The percentage of the earnings in the various districts is more clearly shown in the summary which follows. This table shows for each district the per cent of employees earning less than each specified amount per hour. In this table the time workers and tonnage workers are combined.

PER CENT OF EMPLOYEES IN NONPRODUCTIVE OCCUPATIONS EARNING LESS THAN SPECIFIED AMOUNT PER HOUR, BY DISTRICTS—STEEL FOUNDRIES.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Per cent of employees earning per hour—							
			Under 14 cents.	Under 16 cents.	Under 18 cents.	Under 20 cents.	Under 25 cents.	Under 30 cents.	Under 40 cents.	Under 50 cents.
Eastern	17	209	7.18	27.75	35.41	42.11	74.64	85.17	94.26	96.17
Pittsburgh	14	247	2.83	6.88	19.84	31.58	55.47	72.87	97.98	99.60
Great Lakes and Middle West	30	585	.85	2.05	13.33	19.32	60.17	79.83	98.97	99.49
Total, all districts	64	1,099	2.73	8.66	19.78	28.08	62.08	79.12	97.72	98.82

In the Eastern district 27.75 per cent of the employees in nonproductive occupations earned less than 16 cents per hour. This is in marked contrast with the Pittsburgh district, where only 6.88 per cent of the employees earned less than 16 cents per hour, and with the Great Lakes and Middle West district, where only 2.05 per cent earned less than 16 cents per hour. Of the three principal districts the general level of earnings is lowest in the Eastern district, where 74.64 per cent of all employees earned less than 25 cents per hour.

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CUSTOMARY WORKING HOURS PER WEEK.

Of the employees in nonproductive occupations in steel foundries, 35.37 per cent worked less than 56 hours per week and 71.83 per cent worked 60 hours or less per week. Only 12.49 per cent of the employees in nonproductive occupations worked 84 hours or more per week. The majority of those employees reported as working 84 hours per week were either stationary firemen or gasmen.

The table which follows shows for each district the number and per cent of employees in nonproductive occupations customarily working each classified number of hours per week. In this table the time workers and tonnage workers are combined.

NUMBER AND PER CENT OF EMPLOYEES IN NONPRODUCTIVE OCCUPATIONS CUSTOMARILY WORKING EACH CLASSIFIED NUMBER OF HOURS PER WEEK, BY DISTRICTS—STEEL FOUNDRIES.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

NUMBER.

Districts.	Number of plants.	Normal number of employees.	Employees whose customary working hours per week were—								
			48 and under.	Over 48 and under 56.	56 and under 60.	60.	Over 60 and under 72.	72.	Over 72 and under 84.	84.	Over 84.
Eastern	17	209	2	50	59	17	24	6	16	33	2
Pittsburgh	14	247	1	119	23	34	25	5	10	27	3
Great Lakes and Middle West.	30	585	1	170	21	241	6	71	5	66	4
Total, all districts	64	1,097	4	384	106	294	56	85	31	128	9

PER CENT.

Eastern	17	209	0.96	23.92	28.23	8.13	11.48	2.87	7.66	15.79	0.96
Pittsburgh	14	247	.40	48.18	9.31	13.77	10.12	2.02	4.05	10.93	1.21
Great Lakes and Middle West.	30	585	.17	29.06	3.59	41.20	1.03	12.14	.85	11.28	.68
Total, all districts	64	1,097	.36	35.00	9.66	26.80	5.10	7.75	2.83	11.67	.82

DAYS PER WEEK.

Six days or turns per week was the customary working time for 81.68 per cent of the employees in nonproductive occupations in steel foundries. There were, however, 16.50 per cent who customarily worked 7 days or turns per week. In the Eastern district 25.36 per cent of the employees customarily worked 7 days or turns per week.

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The table which follows shows for each district the number and per cent of employees customarily working each specified number of days or turns per week:

NUMBER AND PER CENT OF EMPLOYEES IN NONPRODUCTIVE OCCUPATIONS WORKING EACH SPECIFIED NUMBER OF DAYS OR TURNS PER WEEK, BY DISTRICTS—STEEL FOUNDRIES.

[Data are not shown separately for districts in which only 1 plant reported, but all plants are included in "Total, all districts."]

Districts.	Number of plants.	Normal number of employees.	Number of employees whose customary working time per week was—					Per cent of employees whose customary working time per week was—				
			5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately	7 days.	5 days.	5 and 6 days alternately.	6 days.	6 and 7 days alternately.	7 days.
Eastern	17	209	2	.....	[1] 150	4	53	0.96	2.43	[1] 71.77	1.91	25.36
Pittsburgh	14	247	6	.....	187	8	46	2.43	.....	75.71	3.24	18.62
Great Lakes and Middle West	30	585	.....	.....	509	.....	76	.....	.....	87.01	.....	12.99
Total, all districts	64	1,097	8	.....	[1] 896	12	181	.73	.....	[1] 81.68	1.09	16.50

[1] Including 2 employees whose customary working time per week was 5 and 7 days alternately

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INDEX.

A.

Page.

Ash men, open-hearth furnaces, duties of..... 93
Ash wheelers, duties of, in—
  Blast furnaces..... 30
  Open-hearth furnaces..... 93

B.

Ball and bell gaugers, tube mills, duties, earnings, etc., of..... 321, 323, 325, 329, 332
Ball men, tube mills, duties of..... 320
Ballers, tube mills, duties, earnings, etc., of..... 320, 323, 325, 326, 329–333
Barmen and clay men, blast furnaces, duties, earnings, etc., of..... 27, 31–34, 42, 47
Barmen, bar mills, duties of..... 265
Bar mills, nonproductive occupations:
  Days or turns per week, employees working each specified number of, by districts..... 465
  Earnings per hour, employees receiving each classified amount of, by districts..... 462
  Earnings per hour, employees receiving less than specified amounts of, by districts..... 463
  Hours of labor per week, employees working each classified number of, by districts..... 464
Bar mills, productive occupations:
  Days or turns per week, employees working each specified number of—
    By districts..... 260, 292
    By occupations..... 289–291
  Earnings per hour, average—
    Members of rolling crews, by occupations..... 278
    Time workers and tonnage workers combined, each occupation, by districts..... 268–273
    Time workers and tonnage workers compared, by occupations..... 274, 275
  Earnings per hour, average, and employees receiving each classified amount of—
    By districts..... 258
    By districts, time workers and tonnage workers..... 280, 281
    By principal occupations..... 276
    By size of mill and by occupation..... 279, 280
  Earnings per hour, employees receiving less than specified amounts of..... 282
  Hours of labor per week, average, and employees working each classified number of—
    By districts..... 259
    By districts, time workers and tonnage workers..... 287, 288
    By occupations..... 283–286
  Occupations, description of..... 260–267
Bar operators, tube mills, duties of..... 320
Bar pullers, tube mills, duties, earnings, etc., of..... 320, 323, 325, 326, 329–333
Barrow men, duties of, in—
  Bessemer converters..... 56
  Blast furnaces..... 21
Bear downs, bar mills, duties of..... 263
Bell and ball gaugers, tube mills, duties, earnings, etc., of..... 321, 323, 325, 329, 332
Bellmen, blast furnaces, duties of..... 22
Bench movers, tube mills, duties of..... 318
Benders' helpers, tube mills, duties, earnings, etc., of..... 319, 323, 325, 329, 332
Benders, tube mills, duties, earnings, etc., of..... 319, 323, 325, 329, 332
Bessemer converters, nonproductive occupations:
  Days or turns per week, employees working each specified number of, by districts..... 438
  Earnings per hour, employees receiving each classified amount of, by districts..... 436
  Earnings per hour, employees receiving less than specified amounts of, by districts..... 437
  Hours of labor per week, employees working each classified number of, by districts..... 438
Bessemer converters, productive occupations:
  Days or turns per week, employees working each specified number of—
    By districts..... 78
    By occupations..... 77, 78
    Summary..... 52
  Earnings per hour, average—
    Time workers and tonnage workers combined, each occupation, by districts..... 67, 68
    Time workers and tonnage workers compared, by occupations..... 69
  Earnings per hour, average, and employees receiving each classified amount of—
    By districts..... 50
    By districts, time workers and tonnage workers..... 71, 72
    By occupations..... 70
  Earnings per hour, average, and employees receiving less than specified amounts of..... 50, 72
  Equipment and method of operation in, description of..... 52–55
  Hours of labor, average, and employees working each classified number of—
    By districts..... 51, 75, 76
    By occupations..... 73–75
  Occupations, description of..... 55–66
Billet straighteners, bar mills, duties of..... 261
Bin men, blast furnaces, duties of..... 20

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Page.
Blacksmiths:
Days or turns per week worked by, by districts ... 403–406
Earnings per hour, classified amounts of, received by, by districts ... 346–350
Hours of labor per week customarily worked by, by districts ... 377–381
Blacksmiths' helpers:
Days or turns per week worked by, by districts ... 402–405, 407
Earnings per hour, classified amounts of, received by, by districts ... 346–348, 351
Hours of labor per week customarily worked by, by districts ... 377–380, 382
Blast engineers, blast furnaces, duties of ... 23
Blast furnaces, nonproductive occupations:
Days or turns per week, employees working each specified number of, by districts ... 435
Earnings per hour, employees receiving each classified amount of, by districts ... 433
Earnings per hour, employees receiving less than specified amounts of, by districts ... 434
Hours of labor per week, employees working each classified number of, by districts ... 435
Blast furnaces, productive occupations:
Days or turns per week, employees working each specified number of—
By districts ... 12, 48
By occupations ... 47, 48
Earnings per hour, average—
Time workers and tonnage workers combined, each occupation, by districts ... 31, 32
Time workers and tonnage workers compared, by occupations ... 34
Earnings per hour, average, and employees earning each classified amount of—
By districts (summary) ... 10
By districts, time workers and tonnage workers ... 37, 38
By principal occupations ... 35
Earnings per hour, employees receiving less than specified amounts of ... 38, 39
Earnings per week, average, and classified weekly amounts of, received by unskilled laborers ... 40
Equipment and method of operation in, description of ... 14–19
Hours of labor per week, average, and employees working each classified number of—
By districts ... 11, 46
By districts, time workers and tonnage workers ... 45, 46
By occupations ... 42, 43
Blast furnaces, steel works, and rolling mills, number of, investigated—
By districts ... xx
By States ... xviii
Blast furnaces, steel works, and rolling mills, summary of earnings, hours, and days of work in ... xviii–lxiii
Blast furnaces, steel works, and rolling mills. (*See also* Earnings and hours and days of work in blast furnaces, steel works, and rolling mills, summary of.)
Bloom boys, puddling mills, duties, earnings, etc., of ... 115, 118–120, 125, 128
Bloom slingers, puddling mills, duties of ... 115
Bloom swingers, puddling mills, duties of ... 115
Blooming mills, nonproductive occupations:
Days or turns per week, employees working each specified number of, by districts ... 450
Earnings per hour, employees receiving each classified amount of, by districts ... 448
Earnings per hour, employees receiving less than specified amounts of, by districts ... 448
Hours of labor per week, employees working each classified number of, by districts ... 449
Blooming mills, productive occupations:
Days or turns per week, employees working each specified number of—
By districts ... 177
By occupations ... 175, 176
Summary ... 145
Earnings per hour, average—
Time workers and tonnage workers combined, for each occupation, by districts ... 163, 164
Time workers and tonnage workers compared, by occupations ... 166
Earnings per hour, average, and employees receiving each classified amount of—
By districts ... 144
By districts, time workers and tonnage workers ... 168, 169
By principal occupations ... 167
Earnings per hour, employees receiving less than specified amounts of ... 144, 169, 170
Equipment and method of operation in, description of ... 146–153
Hours of labor per week, average, and employees working each classified number of—
By districts ... 145
By districts, time workers and tonnage workers ... 173, 174
By occupations ... 171–173
Occupations, description of ... 153–163
Blowers' assistants, Bessemer converters, duties of ... 59
Blowers, duties, earnings, etc., of, in—
Bessemer converters ... 58, 59, 67–70, 73–75, 77, 78
Blast furnaces ... 23, 31–36, 42–44, 47, 48
Blowing engineers' assistants, blast furnaces, duties, earnings, etc., of ... 24, 31–34, 42–44, 47, 48
Blowing engineers, duties, earnings, etc., of, in—
Bessemer converters ... 56, 67–70, 73–75, 77, 78
Blast furnaces ... 23, 31–36, 42–44, 47, 48
Boiler makers and boiler makers' helpers:
Days or turns per week worked by, by districts ... 402–405, 407–409
Earnings per hour, classified amounts of, received by, by districts ... 346–348, 352, 353
Hours of labor per week customarily worked by, by districts ... 377–380, 382–384
Boiler tenders' helpers, blast furnaces, duties of ... 30
Boilers, puddling mills, duties of ... 113
Bottom fillers, blast furnaces, duties, earnings, etc., of ... 21, 31–36, 42–44, 47, 48
Bottom fillers' helpers, blast furnaces, duties of ... 21
Bottom makers, and bottom makers' helpers, duties, earnings, etc., of, in—
Bessemer converters ... 61, 67–70, 73–75, 77, 78
Blooming mills ... 155, 163, 166, 171, 175
Bottom plate men, open-hearth furnaces, duties of ... 90, 91
Box hook men, open-hearth furnaces, duties of ... 86, 87
Braize-machine operators, blast furnace, duties of ... 30
Brakemen, conductors, and switchmen:
Days or turns per week worked by, by districts ... 402–405, 409, 410
Earnings per hour, classified amounts of, received by, by districts ... 346–348, 354, 355

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Page.
Brakemen, conductors, and switchmen—Concluded.
Hours of labor per week customarily worked by, by districts ... 377–380, 384, 385
Breakers, blast furnaces, duties of ... 27
Brickers, open-hearth furnaces, duties of ... 90, 91
Bricklayers and bricklayers' helpers:
Days or turns per week worked by, by districts ... 402–405, 410–412
Earnings per hour, classified amounts of, received by, by districts ... 346–348, 355–358
Hours of labor per week customarily worked by, by districts ... 377–380, 385–387
Bricklayers, ladle, Bessemer converters, duties of ... 63, 64
Brick wheelers, open-hearth furnaces, duties of ... 91
Bucklers, plate mills, duties of ... 187
Buggy men, duties of, in—
Bar mills ... 263
Blast furnaces ... 21
Puddling mills ... 115
Buggy pullers, blast furnaces, duties of ... 21
Bull-doggers, Garrett rod mills, duties of ... 296
Bundlers, bar mills, duties, earnings, etc., of ... 267, 268, 274, 283–286, 289–291
Bushelers' helpers, puddling mills, duties, earnings, etc., of ... 114, 118–120, 125, 128
Bushelers, puddling mills, duties, earnings, etc., of ... 114, 118–120, 125, 128
Butt catchers, standard rail mills, duties of ... 208
Butt pullers, standard rail mills, duties of ... 208
Butt welders, tube mills, duties, earnings, etc., of ... 318, 324–326, 329–333

C.

Cagers, blast furnaces, duties, earnings, etc., of ... 22, 31–36, 42, 47
Cappers, Bessemer converters, duties of ... 63
Car-dumper operators, blast furnaces, duties, earnings, etc., of ... 20, 31–36, 42, 47
Car dumpers, blast furnaces, duties of ... 20
Car pushers, open-hearth furnaces, duties of ... 91
Car trimmers, blast furnaces, duties of ... 30
Carpenters:
Days or turns per week worked by, by districts ... 403–405, 412, 413
Earnings per hour, classified amounts of, received by, by districts ... 346–348, 358, 359
Hours of labor per week customarily worked by, by districts ... 377–380, 387, 388
Carriers, pilers, and stowers, iron, blast furnaces, duties of ... 28
Carters' helpers, blast furnaces, duties of ... 30
Cast-house men, first, second, third, blast furnaces, duties of ... 25, 26
Casting-machine men, blast furnaces, duties of ... 28
Casting men, first, second, third, blast furnaces, duties of ... 25, 26
Casting men, open-hearth furnaces, duties of ... 92
Catchers and roughers, puddling mills, duties of ... 115
Catchers, duties, earnings, etc., of, in—
Bar mills ... 264, 268, 274–280, 283–286, 289–291
Puddling mills ... 118–120, 125, 128
Cellar men, blooming mills, duties of ... 155
Chargers, duties, earnings, etc., of, in—
Bar mills ... 261, 268, 274, 276, 283, 286, 289, 291
Blooming mills ... 163
Garrett rod mills ... 296, 299, 301, 306, 310
Miscellaneous mechanical mills ... 246, 248, 252, 256
Open-hearth furnaces ... 95–97, 101, 105
Plate mills ... 182, 183, 190–192, 197, 201
Structural, light rail, and other shape mills ... 227, 230–232, 237, 241
Tube mills ... 318, 323, 325, 326, 329–333
Chargers, hand, open-hearth furnaces, duties of ... 87, 88
Charging-crane and charging-machine operators, duties, earnings, etc., of, in—
Miscellaneous mechanical mills ... 246, 248, 252, 258
Plate mills ... 182, 190–192, 197, 201
Charging cranemen, blooming mills, duties of ... 156
Charging-machine operators, duties, earnings, etc., of, in—
Garrett rod mills ... 296
Open-hearth furnaces ... 87, 95–97, 101, 102, 105, 106
Standard rail mills ... 206, 212–214, 218, 222
Structural, light rail, and other shape mills ... 227, 230–232, 237, 241
Chasers, bar mills, duties of ... 267
Chippers, duties, earnings, etc., of, in—
Standard rail mills ... 210, 212–215, 218–223
Structural, light rail, and other shape mills ... 229–232, 237, 241
Chippers, steel foundries, classified earnings, hours, etc., of ... 509–513
Cinder-dump laborers, blast furnaces, duties of ... 29, 30
Cinder-dump men, duties of, in—
Bessemer converters ... 65
Open-hearth furnaces ... 93
Cinder men, casting, open-hearth furnaces, duties of ... 91
Cinder men, duties, earnings, etc., of, in—
Bar mills ... 262, 269, 274, 283, 289
Bessemer converters ... 65, 67–70, 73–75, 77, 78
Blast furnaces ... 26, 29–36, 42, 43, 47, 48
Blooming mills ... 155, 163, 160, 171, 175
Plate mills ... 183, 190–192, 197, 201
Puddling mills ... 114, 118–120, 125, 128
Cinder pitmen, duties of, in—
Bessemer converters ... 65
Open-hearth furnaces ... 90
Cinder snappers, and keepers' helpers, third, blast furnaces, duties of ... 26
Cinder snappers, Bessemer converters, duties of ... 65

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Page.
Cinder tappers, duties of, in—
Bessemer converters ... 57
Plate mills ... 183
Cinder wheelers, blooming mills, duties of ... 155
Clay men and barmen, blast furnaces, duties, earnings, etc., of ... 27, 31-34, 42, 47
Clean-ups, duties of, in—
Blooming mills ... 162
Open-hearth furnaces ... 93
Coal passers, duties of, in—
Blooming mills ... 162
Open-hearth furnaces ... 93
Coal screeners, bar mills, duties of ... 261
Coal wheelers, bar mills, duties of ... 261
Coke, ore, or stone fillers, blast furnaces, duties of ... 21
Cold straighteners, bar mills, duties of ... 267
Compounders, crucible furnaces, duties of ... 134
Concrete men, blast furnaces, duties of ... 30
Conductors, brakemen, and switchmen:
Days or turns per week worked by, by districts ... 402-405, 409, 410
Earnings per hour, classified amounts of, received by, by districts ... 346-348, 354, 355
Hours of labor per week customarily worked by, by districts ... 377-380, 384, 385
Controllers, bar mills, duties of ... 267
Conveyor men, duties, earnings, etc., of, in—
Bar mills ... 267
Blooming mills ... 160, 163, 166, 171, 175
Garrett rod mills ... 293, 299, 301, 306, 310
Standard rail mills ... 211-214, 218-223
Structural, light rail, and other shape mills ... 229-232, 237, 241
Conveyor men's helpers, blooming mills, duties of ... 162
Conveyor switchmen, blooming mills, duties of ... 160
Cooling-bed men, standard rail mills, duties of ... 208
Core makers and helpers, steel foundries, classified earnings, hours, etc., of ... 509-513
Cover boys, blooming mills, duties of ... 156
Cover operators, blooming mills, duties, earnings, etc., of ... 156, 163, 166, 171, 175
Crane boys, open-hearth furnaces, duties of ... 92
Cranemen, duties, earnings, etc., of, in—
Bar mills ... 267, 269, 274, 283, 289
Bessemer converters ... 65, 67-70, 73-75, 77, 78
Blast furnaces ... 29, 31-36, 42, 47
Blooming mills ... 161, 164, 166, 171, 175
Garrett rod mills ... 293, 299, 301, 306, 310
Miscellaneous mechanical mills ... 246, 248, 252-254, 256
Open-hearth furnaces ... 92, 93, 95-97, 101, 102, 105, 106
Plate mills ... 189-192, 197, 201
Standard rail mills ... 211-215, 218-223
Structural, light rail, and other shape mills ... 229-232, 237-239, 241
Tube mills ... 321, 323, 325, 329, 332
Cranemen, steel foundries, classified earnings, hours, etc., of ... 509-513
Crane oilers and wipers, blooming mills, duties of ... 162
Crane operators, open-hearth furnaces duties of ... 92
Cross rollers, duties, earnings, etc., of ... 321, 323, 325, 326, 329-333
Crucible furnaces, nonproductive occupations:
Days or turns per week, employees working each specified number of, by districts ... 447
Earnings per hour, employees receiving each classified amount of, by districts ... 445
Hours of labor per week, employees working each classified number of, by districts ... 446
Crucible furnaces, productive occupations:
Days or turns per week, and employees working each specified number of—
By districts ... 131, 143
By occupations ... 142
Earnings per hour, average—
Time workers and tonnage workers combined, each occupation, by districts ... 135
Time workers and tonnage workers compared, by occupations ... 136
Earnings per hour, average, and employees receiving each classified amount of—
By principal districts ... 138
By principal districts, time workers and tonnage workers ... 137
By principal occupations ... 136
Earnings per hour, employees receiving less than specified amounts of ... 130, 138
Equipment and method of operation in, description of ... 131, 132
Hours of labor per week, average, and employees working each classified amount of—
By districts ... 130
By districts, time workers and tonnage workers ... 140, 141
By occupations ... 139, 140
Occupations, description of ... 132-134
Cupola chargers, Bessemer converters, duties, earnings, etc., of ... 56, 67-70, 73-75, 77, 78
Cupola foremen, Bessemer converters, duties of ... 56
Cupola hoist men, Bessemer converters, duties, earnings, etc., of ... 56, 67-70, 73-75, 77, 78
Cupola liners, Bessemer converters, duties, earnings, etc., of ... 57, 67-70, 73-75, 77, 78
Cupola liners' helpers, Bessemer converters, duties, earnings, etc., of ... 57, 67-70, 73-75, 77, 78
Cupola melters, Bessemer converters, duties, earnings, etc., of ... 56, 67-70, 73-75, 77, 78
Cupola patchers, Bessemer converters, duties of ... 57
Cupola tappers, Bessemer converters, duties, earnings, etc., of ... 57, 67-70, 73-75, 77, 78

D.

Days and hours of labor worked in steel foundries, and earnings by occupations (Chapter III) ... 501-522
Days of work, hours, and earnings of employees in general occupations in producing departments ... 426-470
Days or turns per week, and employees working each specified number of, by departments, summary of ... LX-LXIII

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Page.

Days or turns per week and employees working each specified number of. (*See also* Bar mills; Bessemer converters; Blast furnaces; Blooming mills; Crucible furnaces; Garrett rod mills; Miscellaneous mechanical mills; Open-hearth furnaces; Plate mills; Puddling mills; Standard rail mills; Steel foundries; Structural, light rail, and other shape mills; Tube mills.)
Days or turn per week in general occupations, producing departments, employees working each specified number of, summary of 431, 433
Days or turns per week in nonproductive occupations, employees working each specified number of, summary of 342, 402–405
Departments and occupations in iron and steel industry, difficulties in classification of 4–7
Diamond roll hands, Garrett rod mills, duties, earnings, etc., of 296, 299, 301, 306, 310
Districts, geographical, used in present report, explanation of 7
Dock hoisters, blast furnaces, duties of 30
Door and spout liners' helpers, open-hearth furnaces, duties of 93
Door boys, duties of, in—
  Bar mills 263
  Blooming mills 156
  Open-hearth furnaces 88
  Plate mills 183
Door couplers, blooming mills, duties of 163
Door operators, duties, earnings, etc., of, in—
  Bar mills 263, 274, 283, 289
  Miscellaneous mechanical mills 246, 248, 252, 256
  Open-hearth furnaces 88, 95–97, 101, 102, 105, 106
  Plate mills 183, 190–192, 197, 201
  Standard rail mills 206, 212–214, 218, 222
  Structural, light rail, and other shape mills 227, 230–232, 237, 241
Drag downs, bar mills, duties, earnings, etc., of 263, 269, 274, 283–286, 289, 291
Dragouts, bar mills, duties of 266
Draw bench operators, tube mills, duties, earnings, etc., of 323, 325, 329, 332
Drawing cranemen, blooming mills, duties of 156
Drillers and punchers, duties, earnings, etc., of, in—
  Standard rail mills 210, 212–215, 218–223
  Structural, light rail, and other shape mills 230, 232, 237, 241
Drillers, blast furnaces, duties of 30
Dummy boys, bar mills, duties of 267
Dust catcher men, blast furnaces, duties of 24
Dust wheelers, blast furnaces, duties of 24
Dustmen, blast furnaces, duties, earnings, etc., of 24, 31–36, 42, 47

E.

Earnings and hours of labor in iron and steel industry, summary table of, by branches of industry .. XVII
Earnings, hours of labor, and days of work in blast furnaces, steel works, and rolling mills, by departments and districts, summary of ..... XVIII–LXIII
  Days worked per week, by departments ..... LIX–LXIII
  Earnings, by departments ..... XXIV–XXXIV
  Earnings, by departments and districts ..... XXXIV–XXXIX
  Earnings of common laborers ..... XXXIX–XLII
  Hours of labor, by departments ..... XLII–LII
  Hours of labor, by departments and districts ..... LII–LIX
  Investigation, extent of ..... XVIII–XXIV
Earnings, hours of labor, and days of work in general occupations, producing departments 426–470
Earnings, hours of labor, and days worked in nonproductive occupations, by departments (Chapter II) 335–399
Earnings, hours of labor, and days worked in steel foundries, by occupations (Chapter III) 501–522
Earnings per hour and hours of labor per week, summary table of, by branches of industry XXVII
Earnings per hour, average, and classified amounts of, received by common laborers in producing departments, by districts XL
Earnings per hour, average, and employees earning each classified amount of, by departments, summary of ..... XXVI–XXIX, XXXI, XXXII
Earnings per hour, average, and employees earning each classified amount of. (*See also* Bar mills; Bessemer converters; Blast furances; Blooming mills; Crucible furnaces; Garrett rod mills; Miscellaneous mechanical mills; Open-hearth furnaces; Plate mills; Puddling mills; Standard rail mills; Steel foundries; Structural, light rail, and other shape mills; Tube mills.)
Earnings per hour, average, and employees earning less than specified amounts of, by departments. XXXIII
Earnings per hour, average, of employees in productive occupations, each department, by districts.. XXXIV
Earnings per hour, classified, and employees earning each classified amount of, by branches of industry XXXI
Earnings per hour, classified, and per cent of common laborers receiving each classified amount of, all departments, by districts XLI
Earnings per hour, classified, in general occupations, producing departments, and employees earning each classified amount, by districts 427–429
Earnings per hour, classified, in nonproductive occupations, and employees earning each classified amount—
  By districts 338, 339
  By occupations, all districts 345
  By occupations, each district 346–348
Earnings per hour less than specified amounts, per cent of employees receiving—
  By branches of industry XXV
  By districts XXXVI
Earnings per hour of 25 cents and over, per cent of employees in each department receiving, by districts XXXVIII
Edgers, bar mills, duties of 265
Electric power and repairs department, nonproductive occupations. (*See* Power, mechanical and yard force.)
Electricians:
  Days or turns per week worked by, by districts 402–405, 413, 414
  Earnings per hour, classified amounts of, received by, by districts 346–348, 360
  Hours of labor per week customarily worked by, by districts 377–380, 388, 389

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Page.
Engineers:
First, Bessemer converters, duties of ... 56
Second and third, blast furnaces, duties of ... 24
Shear, blooming mills, duties of ... 162
Skip, blast furnaces, duties of ... 22
Engineers, stationary, duties, earnings, etc., of, in—
Bessemer converters ... 65, 67-70, 73-75, 77, 78
Blast furnaces ... 29, 31-36, 42, 47
Blooming mills ... 162, 164, 166, 171, 175
Garrett rod mills ... 298, 299, 301, 306, 310
Miscellaneous mechanical mills ... 246, 248, 252, 256
Open-hearth furnaces ... 93, 95-97, 101, 102, 105
Plate mills ... 189-192, 197, 201
Puddling mills ... 117-120, 125, 128
Standard rail mills ... 212-214, 218, 222
Structural, light rail, and other shape mills ... 229-232, 237, 241
Engineers, yard locomotive:
Days or turns per week worked by, by districts ... 402-405, 414, 415
Earnings per hour, classified amounts of, received by, by districts ... 346-348, 361, 362
Hours of labor per week customarily worked by, by districts ... 377-380, 389, 390
Equipment and method of operation, general description of:
Bessemer converters ... 52-55
Blast furnaces ... 14-18
Crucible furnaces ... 131, 132
Open-hearth furnaces ... 82-86
Puddling mills ... 110-113
Rolling mills ... 146-153
Estimators, blast furnaces, duties of ... 30

F.

Fagot makers, puddling mills, duties of ... 116
Finishers, duties, earnings, etc., of, in—
Bar mills ... 265, 269, 274, 278-280, 284-291
Garrett rod mills ... 296, 299, 301, 306, 310
Structural, light rail, and other shape mills ... 227, 230-232, 237-241
Firemen:
Days or turns per week worked by, by districts ... 402-405, 415, 416
Earnings per hour, classified amounts of, received by, by districts ... 346-348, 362, 363
Hours of labor per week customarily worked by, by districts ... 377-380, 390, 391
Firemen, furnace, bar mills, duties, earnings, etc., of ... 262, 269, 274, 284, 289
Flue dust laborers, blast furnaces, duties of ... 24
Foremen, cast house, front side, and furnace, blast furnaces, duties of ... 23
Foreman, furnace, open-hearth furnaces, duties of ... 88
Founders, blast furnaces, duties of ... 23
Foundry men, blast furnaces, duties of ... 23
Furnace labor, open-hearth furnaces, duties of ... 90
Furnace men, first, second, and third, open-hearth furnaces, duties of ... 88-90
Furnace men, tube mills, duties, earnings, etc., of ... 321, 323, 325, 329, 332
Furnace water tenders, blast furnaces, duties of ... 27

G.

Gaggers. (*See* Straighteners' helpers.)
Garrett rod mills, nonproductive occupations:
Days or turns per week, employees working each specified number of, by districts ... 468
Earnings per hour, employees receiving each classified amount of, by districts ... 466
Earnings per hour, employees receiving less than specified amounts of, by districts ... 466
Hours of labor per week, employees working each classified number of, by districts ... 467
Garrett rod mills, productive occupations:
Days or turns per week and employees working each specified number of—
By occupations ... 310
By principal districts ... 311
Summary ... 295
Earnings per hour, average—
Time workers and tonnage workers combined, each occupation, by districts ... 299, 300
Time workers and tonnage workers compared, by occupations ... 301
Earnings per hour, average, and employees receiving each classified amount of—
By principal districts ... 293
By principal districts, time workers and tonnage workers ... 302-304
By principal occupations ... 302
Earnings per hour, employees receiving less than specified amounts of ... 294, 304, 305
Hours of labor per week, average, and employees working each classified number of—
By principal districts ... 294
By principal districts, time workers and tonnage workers ... 308, 309
By occupations ... 306, 307
Occupations, description of ... 295-298
Gasmen:
Days or turns per week worked by, by districts ... 402-405, 416, 417
Earnings per hour, classified amounts of, received by, by districts ... 346-348, 363, 364
Hours of labor per week customarily worked by, by districts ... 377-380, 391, 392
Gas washers, blast furnaces, duties, earnings, etc., of ... 24, 31-36, 42, 47
Gas washers' helpers, blast furnaces, duties of ... 30
Gaugers, duties, earnings, etc., of, in—
Plate mills ... 186, 190-192, 197, 201
Standard rail mills ... 208
Graders, iron, blast furnaces, duties of ... 28
Greasers, duties, earnings, etc., of, in—
Bar mills ... 267, 269, 274, 284, 289
Blooming mills ... 162, 164, 166, 171, 175
Garrett rod mills ... 298, 299, 301, 306, 310
Miscellaneous mechanical mills ... 246, 248, 252, 256

Digitized by Google

Greasers, duties, earnings, etc., in—Concluded. Page.
Plate mills ... 189–192, 197, 201
Standard rail mills ... 211–214, 218, 222
Structural, light rail, and other shape mills ... 229–232, 237, 241
Grinders, steel founders, classified earnings, hours, etc., of ... 509–513
Grinding laborers, open-hearth furnaces, duties of ... 93
Gripmen, duties of, in—
Bar mills ... 266
Blast furnaces ... 30
Guide setters, duties, earnings, etc., of, in—
Miscellaneous mechanical mills ... 246, 248, 252, 256
Standard rail mills ... 207, 212–215, 218–223
Gulders, bar mills, duties of ... 265

H.

Hammermen, puddling mills, duties, earnings, etc., of ... 115, 118–120, 125, 128
Handlers and loaders, iron, blast furnaces, duties of ... 28
Head and sketch shearmen, plate mills, duties of ... 187
Heaters and heaters' helpers (scrap piles), puddling mills, duties, earnings, etc., of ... 116, 118–120, 125, 128
Heaters, duties, earnings, etc., of, in—
Bar mills ... 261, 270, 274, 284, 289, 291
Blooming mills ... 154, 164, 166, 171, 175
Garrett rod mills ... 296, 299, 301, 302, 306, 307, 310
Miscellaneous mechanical mills ... 246, 248, 252–254, 256
Open-hearth furnaces ... 88–90
Plate mills ... 181, 190–192, 197–202
Standard rail mills ... 206, 212–215, 218–223
Structural, light rail, and other shape mills ... 227, 230–233, 237–239, 242
Heaters' helpers, duties, earnings, etc., of, in—
Bar mills ... 262, 270, 274, 284, 289, 291
Blooming mills ... 154, 164, 166, 171, 175
Garrett rod mills ... 296, 299, 301, 302, 306, 307, 310
Miscellaneous mechanical mills ... 246, 248, 252, 256
Plate mills ... 181, 190–192, 197–202
Standard rail mills ... 212–215, 218–223
Structural, light rail, and other shape mills ... 227, 230–233, 237–239, 242
Hoist engineers, duties of, in—
Bessemer converters ... 65
Blast furnaces ... 22
Hoist men, blooming mills, duties of ... 163
Hook men, duties of, in—
Bar mills ... 265
Blast furnaces ... 30
Structural, light rail, and other shape mills ... 228
Hook men, sheared-plate mills, duties of ... 184
Hook runners, tube mills, duties, earnings, etc., of ... 318, 323, 325, 329–333
Hook ups, duties, earnings, etc., of, in—
Bar mills ... 265, 270, 274, 278–280, 284–291
Puddling mills ... 116, 118–120, 125, 128
Hookers, duties, earnings, etc., of, in—
Bar mills ... 265
Garrett rod mills ... 297, 299, 301, 306, 307, 310
Structural, light rail, and other shape mills ... 228
Hookers, sheared-plate mills, duties of ... 184
Hooks, bar mills, duties of ... 265
Hotbed greasers, standard rail mills, duties of ... 208
Hotbed helpers, blooming mills, duties of ... 162
Hotbed lever men, duties of, in—
Bar mills ... 266
Plate mills ... 186
Standard rail mills ... 208, 212–215, 218–223
Hotbed men, duties, earnings, etc., of, in—
Bar mills ... 266, 270, 275, 276, 284–291
Miscellaneous mechanical mills ... 246, 248, 252–254, 256
Plate mills ... 186, 190–192, 197, 201
Puddling mills ... 118–120, 125, 128
Standard rail mills ... 208, 212–215, 218–223
Structural, light rail, and other shape mills ... 230–233, 237–239, 242
Hotbed men, hook ups, and shearmen, puddling mills, duties of ... 116
Hotbed operators, plate mills, duties of ... 186
Hot-blast men, blast furnaces, duties of ... 23
Hot-dogs men, standard rail mills, duties of ... 208
Hot-oven men, blast furnaces, duties of ... 23
Hot straighteners, bar mills, duties of ... 266
Hours and days of work and earnings of employees in general occupations, producing departments ... 426–470
Hours of labor and days worked, in steel foundries, and earnings, by occupations (Chapter III) ... 501–522
Hours of labor and earnings, by branches of industry, summary table of ... XVII
Hours of labor per week, average, and employees working each classified number of, by departments, summary of ... XLIII, XLVI–XLIX
Hours of labor per week, average, and employees working each classified number of. (*See also* Bar mills; Bessemer converters; Blast furnaces; Blooming mills; Crucible furnaces; Garrett rod mills; Miscellaneous mechanical mills; Open-hearth furnaces; Plate mills; Puddling mills; Standard rail mills; Steel foundries; Structural, light rail, and other shape mills; Tube mills.)
Hours of labor per week, average, of employees in productive occupations, each department, by districts ... LIII

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Page.
Hours of labor per week, classified, and per cent of employees working each classified number of—
By branches of industry ... LI
By departments ... LII
By departments, each district ... LIV, LVI, LVIII
Hours of labor per week, classified, in general occupations, producing departments, and employees working each classified number of, by districts ... 430
Hours of labor per week, classified, in nonproductive occupations, and employees working each classified number of—
By districts ... 341
By occupations, each district ... 378–380
Hours of labor per week, employees working each specified number of, by departments ... XLIII

I.

Ingot-car operators, blooming mills, duties, earnings, etc., of ... 157, 164, 166, 171, 175
Ingot cranemen, duties of, in—
Bessemer converters ... 64, 65
Blooming mills ... 156
Ingot strippers, duties, earnings, etc., of, in—
Bessemer converters ... 64, 65, 67–70, 73–75, 77, 78
Open-hearth furnaces ... 92, 95–97, 101, 102, 105, 106
Ingot tilter, blooming mills, duties of ... 158
Inspectors, duties, earnings, etc., of, in—
Bar mills ... 267
Blast furnaces ... 30
Standard rail mills ... 210, 212–215, 218–223
Iron breakers, blast furnaces, duties, earnings, etc., of ... 27, 31–36, 42, 47
Iron graders, blast furnaces, duties, earnings, etc., of ... 28, 31–36, 42, 47
Iron handlers and loaders, blast furnaces, duties of ... 28, 31–36, 42–44, 47, 48
Iron men, standard rail mills, duties of ... 207
Iron pourers, Bessemer converters, duties, earnings, etc., of ... 57, 58, 67–70, 73–75, 77, 78
Iron tappers, Bessemer converters, duties of ... 57

K.

Keepers and keepers' helpers, blast furnaces, duties, earnings, etc., of ... 24–26, 31–36, 42–44, 47, 48
Kettle men, blast furnaces, duties of ... 29
Key ups, Bessemer converters, duties of ... 63
Knobblers, puddling mills, duties, earnings, etc , of ... 116–120, 125, 128

L.

Laborers, common, in producing and in all departments, per cent of, earning each classified amount ... XL, XLI
Laborers in nonproductive occupations:
Days or turns per week worked by, by districts ... 402–405, 417, 418
Earnings per hour, classified amounts of, received by, by districts ... 346–348, 365, 366
Hours of labor per week customarily worked by, by districts ... 377–380, 392, 393
Laborers in productive occupations, duties, earnings, etc., of, in—
Bar mills ... 267, 270, 275, 276, 284–291
Bessemer converters ... 66–70, 73–75, 77, 78
Blast furnaces ... 20, 30, 32–36, 42–44, 47, 48
Blooming mills ... 162, 164, 166, 171, 175
Crucible furnaces ... 134–136, 139, 142
Garrett rod mills ... 298, 299, 301, 302, 306, 307, 310
Miscellaneous mechanical mills ... 246, 248, 252–254, 256
Open-hearth furnaces ... 90, 93, 95–97, 101, 102, 105, 106
Plate mills ... 189–192, 197, 201
Puddling mills ... 117–120, 125, 128
Standard rail mills ... 211–215, 218–223
Structural, light rail, and other shape mills ... 229–233, 237–241
Tube mills ... 322, 323, 325, 326, 329–333
Laborers, steel foundries, classified earnings, hours, etc., of ... 509–513
Ladle cleaners, Bessemer converters, duties of ... 64
Ladle liners, duties, earnings, etc., of, in—
Bessemer converters ... 63, 64, 67–70, 73–75, 77, 78
Open-hearth furnaces ... 91, 92, 95–97, 101, 102, 105
Ladle liners' helpers, Bessemer converters, duties, earnings, etc., of ... 64, 67–70, 73–75, 77
Ladle men, duties, earnings, etc., of, in—
Blast furnaces ... 28, 29, 32–36, 42, 47
Crucible furnaces ... 134
Open-hearth furnaces ... 92, 95–97, 101, 102, 105, 106
Ladle men's helpers, open-hearth furnaces, duties, earnings, etc., of ... 92, 95–97, 101, 102, 105, 106
Ladle patchers, duties of, in—
Bessemer converters ... 63, 64
Blast furnaces ... 29
Lap welders, tube mills, duties, earnings, etc., of ... 320, 324–326, 329–333
Larry-car operators, blast furnaces, duties of ... 21
Larry men and larry men's helpers, blast furnaces, duties, earnings, etc., of ... 21, 32–36, 42, 47
Layers out, plate mills, duties, earnings, etc., of ... 187, 190–192, 197, 201
Levelers, plate mills, duties of ... 187
Lever men, duties, earnings, etc., of, in—
Blooming mills ... 158
Miscellaneous mechanical mills ... 247, 248, 252, 256
Line drawers, plate mills, duties, earnings, etc., of ... 187, 190–192, 197, 201
Line-ups, plate mills, duties of ... 187
Loaders and handlers, iron, blast furnaces, duties of ... 28
Loaders and stockers, blooming mills, duties, earnings, etc., of ... 161, 164, 166, 171, 175
Loading and shearing, plate mills, nature of work ... 186–189
Loop men, Garrett rod mills, duties of ... 297

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M. Page.

Machine hands, steel foundries, classified earnings, hours, etc., of..... 509–513
Machinists and machinists' helpers:
Days or turns per week worked by, by districts..... 402–405, 418–420
Earnings per hour, classified amounts of, received by, by districts..... 346–348, 366–368
Hours of labor per week customarily worked by, by districts..... 377–380, 394–396
Manganese heaters, Bessemer converters, duties, earnings, etc., of..... 58, 68–70, 73–75, 77
Manganese men, Bessemer converters, duties of..... 58
Manipulators, duties, earnings, etc., of, in—
Blooming mills..... 158, 164, 166, 171, 175
Standard rail mills..... 207
Manipulators, sheared-plate mills, duties, earnings, etc., of..... 184, 190–192, 197–202
Markers, painters, and stampers, plate mills, duties, earnings, etc., of..... 188, 190–192, 197, 201
Mechanical and repairs department. (*See* Power, mechanical, and yard force.)
Mechanical, power, and yard force, earnings, hours, and days of work of employees in..... 471–499
Melters, and melters' helpers, duties, earnings, etc., of, in—
Crucible furnaces..... 133, 135, 136, 139, 140, 142
Open-hearth furnaces..... 88–90, 95–97, 101, 102, 105, 106
Mill greasers, blooming mills, duties of..... 162
Mill scale men, blooming mills, duties of..... 162
Millwrights and millwrights' helpers:
Days or turns per week worked by, by districts..... 402–405, 420–422
Earnings per hour, classified amounts of, received by, by districts..... 346–348, 369–371
Hours of labor per week customarily worked by, by districts..... 377–380, 396, 397
Miscellaneous department, nonproductive occupations. (*See* Power, mechanical and yard force.)
Miscellaneous mechanical mills, nonproductive occupations:
Days or turns per week, employees working each specified number of, by districts..... 461
Earnings per hour, employees receiving each classified amount of, by districts..... 459
Hours of labor per week, employees working each classified number of, by districts..... 460
Miscellaneous mechanical mills, productive occupations:
Days or turns per week, and employees working each specified number of—
By districts..... 245, 257
By occupations..... 256
Earnings per hour, average—
Time workers and tonnage workers combined, each occupation by districts..... 246, 247
Time workers and tonnage workers compared, by occupations..... 248
Earnings per hour, average, and employees receiving each classified number of—
By principal districts..... 243
By principal districts, time workers and tonnage workers..... 250, 251
By principal occupations..... 249
Earnings per hour, employees receiving less than specified amounts of..... 244, 251, 252
Hours of labor per week, average, and employees working each classified number of—
By districts..... 244, 255
By districts, time workers and tonnage workers..... 254, 255
By occupations..... 252–254
Mixers, crucible furnaces, duties of..... 134
Mixing-house laborers, open-hearth furnaces, duties of..... 93
Mold cappers, duties, earnings, etc., of, in—
Bessemer converters..... 63, 68–70, 73–75, 77
Open-hearth furnaces..... 91, 92, 95–97, 101, 102, 105
Mold cleaners, open-hearth furnaces, duties of..... 91
Mold markers, open-hearth furnaces, duties of..... 92
Mold men, open-hearth furnaces, duties of..... 90, 91
Mold setters, open-hearth furnaces, duties of..... 90, 91
Mold tossers, crucible furnaces, duties of..... 134
Mold washers, blast furnaces, duties of..... 28
Molders, and molders' helpers, steel, in steel foundries, classified earnings, hours, etc., of..... 509–513
Molders, crucible furnaces, duties, earnings, etc., of..... 134–136, 139, 142
Monkey men, blast furnaces, duties of..... 26
Motor men, stock house, blast furnaces, duties of..... 21
Motor operators, tube mills, duties, earnings, etc., of..... 322, 323, 325, 329, 332
Moving-bench boys, tube mills, duties of..... 318

N.

Neck greasers, blooming mills, duties of..... 162
Nozzle setters, open-hearth furnaces, duties of..... 92

O.

Occupations and departments in iron and steel industry, difficulties in classification of..... 4–7
Occupations, general and productive, number of employees in each classification, in plants investigated—
By branches of industry..... XXIII
By departments..... XXII
By districts..... XX
Occupations, general, in producing departments, earnings, hours of labor, and days or turns per week of employees in..... 426–470
Occupations, nonproductive, earnings, hours of labor, and days or turns per week of employees in—
By departments (Chapter II)..... 335–499
Power, mechanical and yard force..... 471–499
Producing departments..... 426–470
Occupations, nonproductive, employees in each of specified:
Days or turns per week, specified, customarily worked by..... 402–405
Earnings per hour, classified amounts of, received by..... 345–348
Hours of labor per week, classified, customarily worked by..... 377–380
Occupations, productive, average earnings of employees in, each department, by districts..... XXXIV

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Page.
Occupations, productive, steel foundries, employees in each of specified:
Days or turns per week, specified, customarily worked by ... 513
Earnings per hour, classified amounts of, received by ... 509, 510
Hours of labor per week, classified, customarily worked by ... 512
Off-bearers, blast furnaces, duties of ... 28
Oilers and wipers:
Days or turns per week worked by, by districts ... 402–405, 422, 423
Earnings per hour, classified amounts of, received by, by districts ... 346–348, 371, 372
Hours of labor per week customarily worked by, by districts ... 377–380, 398
Open-hearth furnaces, nonproductive occupations:
Days or turns per week, employees working each specified number of, by districts ... 442
Earnings per hour, employees receiving each classified amount of, by districts ... 439
Earnings per hour, employees receiving less than specified amounts of ... 440
Hours of labor per week, employees working each classified number of, by districts ... 441
Open-hearth furnaces, productive occupations:
Days or turns per week, and employees working each specified number of—
By districts ... 107
By occupations ... 105, 106
Summary ... 82
Earnings per hour, average—
Time workers and tonnage workers combined, each occupation, by districts ... 95, 96
Time workers and tonnage workers compared, by occupations ... 97
Earnings per hour, average, and employees receiving each classified amount of—
By districts ... 79, 99
By districts, time workers and tonnage workers ... 98
By occupations ... 97
Earnings per hour, employees receiving less than specified amounts of ... 80, 99, 100
Equipment and method of operation in, description of ... 82–86
Hours of labor per week, average, and employees working each classified number of—
By districts ... 81
By districts, time workers and tonnage workers ... 103, 104
By occupations ... 101, 102
Occupations, description of ... 86–94
Ore-bridge operators, blast furnaces, duties, earnings, etc., of ... 20, 32–36, 42, 47
Ore, coke, or stone fillers, blast furnaces, duties of ... 21
Oval roll hands, Garrett rod mills, duties, earnings, etc., of ... 296, 300–302, 306, 307, 310
Overseers, blast furnaces, duties of ... 23

P.

Painters, markers, and stampers, plate mills, duties of ... 188
Pan men, blooming mills, duties of ... 163
Pass men, bar mills, duties of ... 265
Patchers and sticker dressers, tube mills, duties, earnings, etc., of ... 321, 323, 325, 329, 332
Patternmakers, steel foundries, classified earnings, hours, etc., of ... 509–513
Peel men, plate mills, duties of ... 182
Pickers, tube mills, duties, earnings, etc., of ... 318, 324, 325, 329, 333
Piece rates and tonnage rates, essential difference between ... 7, 8
Pig breakers, blast furnaces, duties of ... 27
Pig-machine men, blast furnaces, duties, earnings of ... 28, 32–36, 42, 47
Pig stickers, blast furnaces, duties of ... 28
Pilers, stowers, and carriers, iron, blast furnaces, duties of ... 28
Pipe fitters:
Days or turns per week worked by, by districts ... 402–405, 423, 424
Earnings per hour, classified amounts of, received by, by districts ... 346–348, 373
Hours of labor per week customarily worked by, by districts ... 377–380, 398, 399
Pipe makers, crucible furnaces, duties of ... 134
Pit boys, blooming mills, duties of ... 156
Pit clean ups, open-hearth furnaces, duties of ... 91
Pit cranemen, blooming mills, duties, earnings, etc., of ... 156, 164, 166, 171, 175
Pit hands, tube mills, duties, earnings, etc., of ... 324, 325, 329, 333
Pit heaters, blooming mills, duties of ... 154
Pit helpers, open-hearth furnaces, duties, earnings, etc., of ... 91, 95–97, 101, 102, 105, 106
Pit labor, open-hearth furnaces, duties of ... 91
Pit tongs men's helpers, blooming mills, duties of ... 162
Pitmen, open-hearth furnaces, duties, earnings, etc., of ... 90, 95–97, 101, 102, 105, 106
Planishers, bar mills, duties of ... 265
Plants investigated, number of, and normal number of employees ... xvii
Plate mills, nonproductive occupations:
Days or turns per week, employees working each specified number of, by districts ... 453
Earnings per hour, employees receiving each classified amount of, by districts ... 451
Hours of labor per week, employees working each classified number of, by districts ... 452
Plate mills, productive occupations:
Days or turns per week, and employees working each specified number of—
By districts ... 180, 202
By occupations ... 201, 202
Earnings per hour, average—
Time workers and tonnage workers combined, each occupation, by districts ... 190, 191
Time workers and tonnage workers compared, by occupations ... 192
Earnings per hour, average, and employees receiving each classified amount of—
By districts ... 178
By districts, time workers and tonnage workers ... 194, 195
By occupations ... 193
Earnings per hour, employees receiving less than specified amounts of ... 179, 196
Hours of labor per week, average, and employees working each classified number of—
By districts ... 180
By districts, time workers and tonnage workers ... 199, 200
By occupations ... 197–199
Occupations, description of ... 181–189

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Page.
Plate shearmen, plate mills, duties of ... 187
Platform men, open-hearth furnaces, duties of ... 92
Pony roughers, bar mills, duties of ... 265
Pot boys, crucible furnaces, duties of ... 134
Pot men, blast furnaces, duties of ... 29
Pot pullers, crucible furnaces, duties of ... 133
Pot shakers, crucible furnaces, duties of ... 134
Pourers, blast furnaces, duties of ... 28
Power, mechanical, and yard force, nonproductive occupations:
  Days or turns per week, employees working each specified number of—
    All departments ... 475
    Electric power and repairs department ... 487
    Mechanical and repairs department ... 494
    Miscellaneous department ... 499
    Shipping department ... 496
    Shops ... 492
    Steam, gas, and water department ... 479
    Yard and transportation department ... 483
  Earnings per hour, classified, and employees receiving each classified amount of, by districts—
    All departments ... 472, 473
    Electric power and repairs department ... 484, 485
    Mechanical and repairs department ... 492, 493
    Miscellaneous department ... 497, 498
    Shipping department ... 495
    Shops ... 488, 489
    Steam, gas, and water department ... 476, 477
    Yard and transportation department ... 480, 481
  Hours of labor per week, classified, and employees working each classified number of—
    All departments ... 474
    Electric power and repairs department ... 486
    Mechanical and repairs department ... 493
    Miscellaneous department ... 498
    Shipping department ... 496
    Shops ... 490
    Steam, gas, and water department ... 478
    Yard and transportation department ... 482
Producing departments, general occupations in, earnings, hours, and days of work of employees in ... 426–470
Productive occupations and general occupations, employees in each, for whom data are reported, and number of plants:
  By branches of industry ... XXIII
  By departments ... XXII
  By districts ... XX
Productive occupations, average earnings of employees in, each department, by districts ... XXXIV
Puddlers and puddlers' helpers, puddling mills, duties, earnings, etc., of ... 113, 114, 118–120, 125, 128
Puddling mills, nonproductive occupations:
  Days or turns per week, employees working each specified number of, by districts ... 445
  Earnings per hour, employees receiving each specified amount of, by districts ... 443
  Hours of labor per week, employees working each classified number of, by districts ... 444
Puddling mills, productive occupations:
  Days or turns per week, and employees working each specified number of—
    By districts ... 129
    By occupations ... 128
    Summary ... 110
  Earnings per hour, average—
    Time workers and tonnage workers combined, each occupation, by districts ... 118, 119
    Time workers and tonnage workers compared, by occupations ... 120
  Earnings per hour, average, and employees receiving each classified amount of—
    By districts ... 108
    By districts, time workers and tonnage workers ... 122, 123
    By occupations ... 121
  Earnings per hour, employees receiving less than specified amounts of ... 108, 124
  Equipment and method of operation in, description of ... 110–113
  Hours of labor per week, average, and employees working each classified number of—
    By districts ... 109
    By districts, time workers and tonnage workers ... 126, 127
    By occupations ... 125
  Occupations, description of ... 113–117
Pull ups, duties of, in—
  Bar mills ... 263
  Open-hearth furnaces ... 88
  Plate mills ... 183
Pullers out, crucible furnaces, duties, earnings, etc., of ... 133, 135, 136, 139, 140, 142
Pushers, duties, earnings, etc., of, in—
  Garrett rod mills ... 300, 301, 306, 310
  Tube mills ... 319, 324, 325, 329, 333

R.

Reelers, Garrett rod mills, duties, earnings, etc., of ... 298, 300–302, 306, 307, 310
Regulators, Bessemer converters, duties, earnings, etc., of ... 59, 68–70, 73–75, 77, 78
Restraighteners, standard rail mills, duties, earnings, etc., of ... 212, 214, 218
Riggers:
  Days or turns per week worked by, by districts ... 402–405, 424, 425
  Earnings per hour, classified amounts of, received by, by districts ... 346–348, 374, 375
  Hours of labor per week customarily worked by, by districts ... 377–380, 399, 400
Roll engineers, duties, earnings, etc., of, in—
  Bar mills ... 263, 270, 275, 276, 284–291
  Blooming mills ... 157, 164, 166, 171, 175

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Roll engineers, duties, earnings, etc., of, in—Concluded. Page.
Garrett rod mills... 296, 300-302, 306, 307, 310
Miscellaneous mechanical mills... 247-249, 252-254, 256
Plate mills... 183, 190-192, 197-202
Standard rail mills... 206, 212-215, 218-223
Structural, light rail, and other shape mills... 227, 230-233, 237-239, 242
Roll greasers, blooming mills, duties of... 162
Roll hands, duties, earnings, etc., of, in—
Bar mills... 265, 271, 275, 276, 279, 284-291
Garrett rod mills... 297, 300-302, 306, 307, 310
Miscellaneous mechanical mills... 247-249, 252-254, 256
Plate mills... 185, 186, 191, 192, 197-202
Puddling mills... 115, 119, 120, 125-128
Structural, light-rail, and other shape mills... 228, 230-233, 237-239, 242
Roll-scale men, duties, earnings, etc., of, in—
Bar mills... 267
Blooming mills... 162, 164, 166, 171, 175
Puddling mills... 116, 119, 120, 125, 128
Roll setters and helpers, tube mills, duties, earnings, etc., of... 322, 324, 325, 329-333
Roll spell hands, bar mills, duties of... 265
Roll turners:
Days or turns per week worked by, by districts... 402-405, 425, 426
Earnings per hour, classified amounts of, received by, by districts... 346-348, 375, 376
Hours of labor per week customarily worked by, by districts... 377-380, 400, 401
Rollers, duties, earnings, etc., of, in—
Bar mills... 263, 270, 271, 275, 276, 284-291
Blooming mills... 158, 164, 166, 171, 175
Garrett rod mills... 296, 300-302, 306, 307, 310
Miscellaneous mechanical mills... 247-249, 252-254, 256
Plate mills... 183, 185, 186, 190-192, 197-202
Puddling mills... 115, 119, 120, 125, 128
Standard rail mills... 206, 212-215, 218-223
Structural, light rail, and other shape mills... 227, 230-233, 237-239, 242
Rollers' helpers, duties, earnings, etc., of, in—
Bar mills... 265
Garrett rod mills... 296, 300-302, 306, 307, 310
Miscellaneous mechanical mills... 247-249, 252-254, 256
Standard rail mills... 207, 213-215, 218-223
Rollers off, tube mills, duties, earnings, etc., of... 319, 324, 325, 329, 333
Rolling crews, bar mills, average and classified amount of earnings of... 278-280
Rolling crews, plate mills, duties, earnings, etc., of... 183-185, 193, 198, 199, 202
Rolling mills, equipment and method of operation in, description of... 146-153
Rolling mills, steel works, and blast furnaces, number of investigated—
By districts... XX
By States... XVIII
Rolling mills steel works, and blast furnaces, summary of earnings, hours, and days of work in.. XVIII-LXIII
Rolling mills, steel works, and blast furnaces. (*See also* Earnings and hours and days of work in blast furnaces, steel works, and rolling mills, summary of.)
Root knockers, open-hearth furnaces, duties of... 90, 91
Rotary shearmen, plate mills, duties of... 187
Roughers and catchers, puddling mills, duties of... 115
Roughers, duties, earnings, etc., of, in—
Bar mills... 264, 272, 275, 276, 278-280, 284-291
Garrett rod mills... 296, 300-302, 306, 307, 310
Puddling mills... 119, 120, 125, 128
Structural, light rail, and other shape mills... 227, 230-233, 237-239, 242
Roughers' helpers, bar mills, duties of... 265
Run downs, bar mills, duties of... 263
Runner makers, open-hearth furnaces, duties of... 90, 91
Runner men, duties of, in—
Bessemer converters... 57, 58
Blast furnaces... 25, 26

S.

Salters, sheared-plate mills, duties of... 185
Sand cutters, blast furnaces, duties of... 25
Saw men and saw men's helpers, duties, earnings, etc., of, in—
Standard rail mills... 208, 211, 213-215, 218-223
Structural, light rail, and other shape mills... 228, 231-233, 237-241
Tube mills... 321, 324, 325, 329, 333
Scale-car operators, blast furnaces, duties of... 21
Scale men's helpers, blast furnaces, duties of... 30
Scalers, sheared-plate mills, duties of... 185
Scope of investigation, data, and method of presentation... 3-9
Scrap drop engineers, Bessemer converters, duties of... 65
Scrap men, duties, earnings, etc., of, in—
Bar mills... 266
Bessemer converters... 58
Blast furnaces... 21, 32-36, 42, 47
Garrett rod mills... 298, 300-302, 306, 310
Scrap pickers, duties of, in—
Blast furnaces... 21
Garrett rod mills... 298
Scrap pilers, puddling mills, duties of... 116, 119, 120, 125, 128
Scrap shovelers, Bessemer converters, duties of... 58
Scrappers, duties of, in—
Blast furnaces... 21
Puddling mills... 114

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Page.
Screw men, duties, earnings, etc., of, in—
Bar mills ... 265
Plate mills ... 184–186, 191–193, 197–202
Setters in, crucible furnaces, duties of ... 133
Sewer men, blooming mills, duties of ... 162
Sheared-plate mills, duties of rolling crew in ... 183–185
Shearing and loading, plate mills, nature of work in ... 186–189
Shearmen and saw men, and helpers, duties, earnings, etc., of, in—
Bar mills ... 266, 272, 275, 276, 284–291
Miscellaneous mechanical mills ... 247–249, 252–256
Structural, light rail and other shape mills ... 228, 231–233, 237–239, 242
Shearmen, duties, earnings, etc., of, in—
Blooming mills ... 160, 164, 166, 171, 175
Crucible furnaces ... 134–136, 139, 142
Garrett rod mills ... 298, 300, 301, 306, 310
Plate mills ... 187, 191–193, 197–202
Puddling mills ... 119, 120, 125, 128
Structural, light rail, and other shape mills ... 228, 231–233, 237–239, 242
Shearmen, hook ups, and hotbed men, puddling mills, duties of ... 46
Shearmen's helpers, duties, earnings, etc., of, in—
Blooming mills ... 160, 164, 166, 171, 175
Plate mills ... 188, 191–193, 197–202
Shinglers, puddling mills, duties of ... 115
Shop department, nonproductive occupations. (*See* Power, mechanical, and yard force.)
Shove ups, bar mills, duties of ... 265
Size rollers and take-offs, tube mills, duties, earnings, etc., of ... 320, 321, 324, 325, 329–333
Sketch and head shearmen, plate mills, duties of ... 187
Sketchers, plate mills, duties of ... 187
Skip engineers, Bessemer converters, duties of ... 65
Skip operators, blast furnaces, duties, earnings, etc., of ... 22, 32–36, 42, 47
Skullers, duties of, in—
Bessemer converters ... 64
Blast furnaces ... 29
Slag breakers, blast furnaces, duties of ... 30
Slag men, duties of, in—
Bessemer converters ... 59, 65
Blast furnaces ... 26, 29, 30
Blooming mills ... 155
Open-hearth furnaces ... 90, 91
Plate mills ... 183
Slag wheelers, Bessemer converters, duties of ... 65
Sledgers, duties of, in—
Open-hearth furnaces ... 90, 91
Tube mills ... 319
Soaking pit cranemen, blooming mills, duties of ... 156
Spanner men, bar mills, duties of ... 265
Squeezer men, puddling mills, duties, earnings, etc., of ... 114, 119, 120, 125, 128
Stampers and strikers, blooming mills, duties of ... 161
Stampers, duties, earnings, etc., of, in—
Blooming mills ... 161, 164, 166, 171, 175
Standard rail mills ... 208, 213–215, 218, 222
Structural, light rail, and other shape mills ... 231, 232, 237, 241
Stampers, markers, and painters, plate mills, duties of ... 188
Standard rail mills, nonproductive occupations:
Days or turns per week, employees working each specified number of, by districts ... 456
Earnings per hour, employees receiving each classified amount of, by districts ... 454
Hours of labor per week, employees working each classified number of, by districts ... 455
Standard rail mills, productive occupations:
Days or turns per week, and employees working each specified number of—
By districts ... 223, 224
By occupations ... 222, 223
Summary ... 205
Earnings per hour, average—
Time workers and tonnage workers combined, each occupation, by districts ... 212, 213
Time workers and tonnage workers compared, by occupations ... 214
Earnings per hour, average, and employees receiving each classified amount of—
By districts ... 203, 216
By districts, time workers and tonnage workers ... 216
By occupations ... 215
Earnings per hour, employees earning less than specified amounts of ... 204, 217
Hours of labor per week, average, and employees working each classified number of—
By districts ... 204, 221
By districts, time workers and tonnage workers ... 220
By occupations ... 218–220
Occupations, description of ... 205–211
Steam, gas, and water department, nonproductive occupations. (*See* Power, mechanical, and yard force.)
Steel foundries:
Days or turns per week, and employees working each specified number of—
By districts, nonproductive occupations ... 508, 522
By districts, productive occupations ... 508, 518
By districts, productive and nonproductive occupations ... 508
By occupations ... 513
Earnings per hour, and employees receiving each classified amount of—
By districts, nonproductive occupations ... 505, 519
By districts, productive occupations ... 505, 515
By districts, productive and nonproductive occupations ... 505
By districts, time workers and tonnage workers ... 514
By occupations ... 509, 510

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Steel foundries—Concluded. Page.
Earnings per hour, employees receiving less than specified amounts of, in—
Nonproductive occupations ... 520
Productive occupations ... 516
Productive and nonproductive occupations ... 506
Hours of labor per week, and employees working each classified number of—
By districts, nonproductive occupations ... 507, 521
By districts, productive occupations ... 517, 518
By districts, productive and nonproductive occupations ... 507
By occupations ... 512
Plants investigated, number of, and normal number of employees ... 505
Steel handlers, bar mills, duties of ... 261
Steel pourers, duties, earnings, etc., of, in—
Bessemer converters ... 61, 62, 68-70, 73-75, 77, 78
Open-hearth furnaces ... 91, 92, 96, 97, 101, 102, 105, 106
Steel works, rolling mills, and blast furnaces, number of investigated—
By districts ... xx
By States ... xviii
Steel works, rolling mills, and blast furnaces, summary of earnings, hours and days of work in ... xviii-lxiii
Steel works, rolling mills, and blast furnaces. (*See also* Earnings and hours and days of work in blast furnaces, steel works, and rolling mills, summary of.)
Sticker dresser and patchers, tube mills, duties, earnings, etc., of ... 321, 323, 332
Stick ins, bar mills, duties of ... 264
Stockers and loaders, blooming mills, duties, earnings, etc., of ... 161, 164, 166, 171, 175
Stockers, duties, earnings, etc., of, in—
Bar mills ... 261, 272, 275, 276, 284-291
Bessemer converters ... 56, 68-70, 73-75, 77, 78
Blast furnaces ... 32-36, 42-44, 47, 48
Garrett rod mills ... 296, 300-302, 306, 307, 310
Miscellaneous mechanical mills ... 247-249, 252, 256
Open-hearth furnaces ... 86, 87, 96, 97, 101, 102, 105, 106
Plate mills ... 189, 191-193, 197, 201
Puddling mills ... 113, 119, 120, 125, 128
Structural, light rail, and other shape mills ... 227, 231-233, 237-242
Stock laborers, Bessemer converters, duties of ... 56
Stock unloaders, duties of, in—
Bar mills ... 261
Bessemer converters ... 56
Blast furnaces ... 20
Open-hearth furnaces ... 86, 87
Stockyard (house) laborers, blast furnaces, duties of ... 20
Stone, coke, or ore fillers, blast furnaces, duties of ... 21
Stopper makers' helpers, open-hearth furnaces, duties of ... 93
Stopper setters and helpers, duties, earnings, etc., of, in—
Bessemer converters ... 62, 63, 68-70, 73-75, 77, 78
Open-hearth furnaces ... 91, 92, 96, 97, 101, 102, 105, 106
Stove cleaners and helpers, blast furnaces, duties, earnings, etc., of ... 23, 32-36, 42, 47
Stove men, blast furnaces, duties of ... 23
Stove tenders and helpers, blast furnaces, duties, earnings, etc., of ... 23, 32-36, 42-44, 47, 48
Stowers, pilers, and carriers, iron, blast furnaces, duties of ... 28
Straighteners, duties, earnings, etc., of, in—
Plate mills ... 187, 191-193, 197, 201
Structural, light rail, and other shape mills ... 228, 231-233, 237-242
Tube mills ... 321, 324, 325, 329, 333
Straighteners, gag press, standard rail mills, duties, earnings, etc., of ... 209, 213-215, 218-223
Straighteners' helpers (gaggers), duties, earnings, etc., of, in—
Standard rail mills ... 209, 213-215, 218-223
Structural, light rail, and other shape mills ... 229-223, 237-239, 242
Straightening-machine operators, plate mills, duties of ... 187
Stranders, bar mills, duties, earnings, etc., of ... 264, 272-276, 278-280, 284-291
Strikers and stampers, blooming mills, duties of ... 161
Stripper men, Bessemer converters, duties of ... 64, 65
Structural, light rail, and other shape mills, nonproductive occupations:
Days or turns per week, employees working each specified number of, by districts ... 458
Earnings per hour, employees receiving each classified amount of, by districts ... 457
Hours of labor per week, employees working each classified number of, by districts ... 458
Structural, light rail, and other shape mills, productive occupations:
Days or turns per week, and employees working each specified number of—
By districts ... 226, 242
By occupations ... 241, 242
Earnings per hour, average—
Time workers and tonnage workers combined, each occupation, by districts ... 230, 231
Time workers and tonnage workers compared, by occupations ... 232
Earnings per hour, average, and employees receiving each classified amount of—
By districts ... 224, 235
By districts, time workers and tonnage workers ... 234
By occupations ... 233
Earnings per hour, employees receiving less than specified amounts of ... 225, 236
Hours of labor per week, average, and employees working each classified number of—
By districts ... 225, 240
By districts, time workers and tonnage workers ... 239
By occupations ... 237-239
Occupations, description of ... 226-229
Sweepers, blast furnaces, duties of ... 30
Sweep-offs, sheared-plate mills, duties of ... 185
Swingers-down, standard rail mills, duties of ... 209

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Switchmen, conductors, and brakemen: Page.
Days or turns per week worked by, by districts ... 402-405, 400, 410
Earnings per hour, classified amounts of, received by, by districts ... 346-348, 354, 355
Hours of labor per week customarily worked by, by districts ... 377-380, 383, 384

T.

Table greasers, blooming mills, duties of ... 162
Table lever men, duties, earnings, etc., of, in—
Miscellaneous mechanical mills ... 247-249, 252-256
Standard rail mills ... 207, 213-215, 218-223
Structural, light rail, and other shape mills ... 227, 231-233, 237, 241
Table men, duties, earnings, etc., of, in—
Blooming mills ... 159, 164, 166, 171, 175
Plate mills ... 184, 191, 192, 197-202
Standard rail mills ... 207, 213-215, 218-223
Structural, light rail, and other shape mills ... 228, 231-233, 237-242
Table oilers, blooming mills, duties of ... 162
Take-offs and size rollers, tube mills, duties, earnings, etc., of ... 320, 321, 324, 325, 329-333
Take-offs, Garrett rod mills, duties, earnings, etc., of ... 298, 300, 301, 306, 310
Take-off tongs, tube mills, duties, earnings, etc., of ... 319, 324, 325, 329, 333
Teemers, crucible furnaces, duties, earnings, etc., of ... 134-136, 139, 142
Telegraphers, bar mills, duties of ... 263
Test boys, blooming mills, duties of ... 163
Time workers and tonnage workers, days or turns per week, earnings, etc., of. (*See* Bar mills; Bessemer converters; Blooming mills; Crucible furnaces; Garrett rod mills; Miscellaneous mechanical mills; Open-hearth furnaces; Plate mills; Puddling mills; Standard rail mills; Steel foundries; Structural, light rail, and other shape mills; Tube mills.)
Tong runners, tube mills, duties, earnings, etc., of ... 319, 324, 325, 329, 333
Tonnage rates and piece rates, essential difference between ... 7, 8
Toolmen, blast furnaces, duties of ... 27, 30
Top chargers, duties of, in—
Bessemer converters ... 56
Blast furnaces ... 22
Top fillers, blast furnaces, duties, earnings, etc., of ... 22, 32-36, 42-44, 47, 48
Topmen, duties of, in—
Bessemer converters ... 56
Blast furnaces ... 22
Transfer car operators, blast furnaces, duties, earnings, etc., of ... 20, 32-36, 42, 47
Transfer greasers, blooming mills, duties of ... 162
Transfer lever men, duties of, in—
Blooming mills ... 160
Plate mills ... 186
Transfer men, duties of, in—
Bar mills ... 263
Blooming mills ... 160
Tresle men, blast furnaces, duties of ... 20
Trough men, duties of, in—
Bessemer converters ... 57, 58
Blast furnaces ... 25, 26, 28
Tube mills, nonproductive occupations:
Days or turns per week, employees working each specified number of, by districts ... 470
Earnings per hour, employees receiving each classified amount of, by districts ... 469
Hours of labor per week, employees working each specified number of, by districts ... 470
Tube mills, productive occupations:
Days or turns per week, and employees working each specified number of—
By districts ... 334
By occupations ... 332, 333
Summary ... 313
Earnings per hour, average—
Time workers and tonnage workers combined, each occupation, by districts ... 323, 324
Time workers and tonnage workers compared, by occupations ... 325
Earnings per hour, average, and employees receiving each classified amount of—
By districts ... 312
By districts, time workers and tonnage workers ... 327, 328
By occupations ... 326
Earnings per hour, employees receiving less than specified amounts of ... 312, 328
Equipment and method of operation in, general description of ... 314-317
Hours of labor per week, average, and employees working each classified number of—
By districts ... 313, 332
By districts, time workers and tonnage workers ... 331
By occupations ... 329-331
Occupations, description of ... 317-322
Turndown men (or turndowns), duties, earnings, etc., of, in—
Blast furnaces ... 28
Tube mills ... 320, 324, 325, 329, 330, 333
Tuyere men, blast furnaces, duties, earnings, etc., of ... 27, 32-36, 42, 47

U.

Under hands, puddling mills, duties of ... 114
Universal mills, 48-inch, plate mills, nature of work in ... 185

V.

Vessel cinder men, Bessemer converters, duties of ... 65
Vessel men and helpers, Bessemer converters, duties, earnings, etc., of ... 59, 60, 68-70, 73-75, 77, 78
Vessel scrappers, Bessemer converters, duties, earnings, etc., of ... 58, 68-70, 73-75, 77, 78

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W.

Page.
Wage groups, employees in each of three specified, by departments ..... xxxi, xxxiii
Wages. (*See* Earnings.)
Water tenders, sheared-plate mills, duties of 185
Wipers and crane oilers, blooming mills, duties of 162
Wipers and oilers:
  Days or turns per week worked by, by districts 402–405, 422, 423
  Earnings per hour, classified amounts of, received by, by districts 346–348, 371, 372
  Hours of labor per week customarily worked by, by districts 377–380, 398
Wrenchers, duties, etc., in—
  Blast furnaces 20
  Plate mills, sheared-plate 185

Y.

Yard laborers, blast furnaces, duties of 30
Yard, power, and mechanical force, earnings, hours and days of work of employees in 471–499
Yardmen, open-hearth furnaces, duties of 93

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